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DISEASES CAUSED BY BACTERIA AND FUNGI

Papavassiliou, J. & Obiger, G. (1959). Über das Vorkommen und das Phagenbild von Koagulase-positiven Staphylokokken in Milch. **[Occurrence and phage type of coagulase-positive staphylococci in milk.]**—Zbl. Bakt. I. (Orig.) **175,** 505-519. [Summaries in English, French, Spanish and Russian.] **606**

Coagulase-positive strains of *Staph. aureus* were isolated from the milk of 87 of 265 cows, 60 of 150 samples of churn milk, one of 100 samples of pasteurized milk, and from the nose of one of 17 milking attendants. 57 strains were of phage type III, 24 of type III/IV, 2 of type IV and one of type I/III. Most strains formed beta toxin. Only 7 of 110 strains reacted with Oeding's serum, which agglutinates coagulase-positive *Staph. aureus* of human origin. Most strains fermented mannite, phosphate and gelatin, but so did many coagulase-negative strains isolated from milk. It is considered that coagulase-positive staphylococci in milk are not pathogenic for man.—M.G.G.

Richou, R., Quinchon, C. & Pataléon, J. (1959). Recherches sur les agglutinines antistaphylococciques naturelles des sérums de porcs. **[Naturally occurring anti-staphylococcal agglutinins in serum of pigs.]**—C.R. Acad. Sci. Paris **248,** 1453-1455. **607**

Serum from 15 healthy pigs was tested against 24 strains of staphylococci including one strain from bovine mastitis, apparently non-pathogenic strains from the skin of pigs, and strains suspected of causing food poisoning. In general the agglutinin titres were lower and the occurrence of agglutinins was more irregular than in horses, cattle and sheep. The results were tabulated. Agglutinins to both pathogenic and non-pathogenic strains were present in most pigs.—R.M.

Dal Santo, F. (1959). La stafilococcosi come malattia neonatale del pulcino. **[Staphylococcus infection of newly hatched chicks.]**—Zooprofilassi **14,** 653-667. **608**

All of 250 chicks aged 2 days died within a few hours after a train journey lasting 20 hours. Death was attributed to *Staphylococcus pyogenes* isolated from the caeca, yolk sac and heart blood.—T.E.G.R.

Cohn, Z. A. & Morse, S. I. (1959). **Interactions between rabbit polymorphonuclear leucocytes and staphylococci.**—J. exp. Med. **110,** 419-443. [Authors' summary modified.] **609**

The authors studied the fate and localization of staphylococci in homogeneous suspensions of rabbit polymorphonuclear leucocytes. Coagulase-positive (c.p.) strains of *Staph. aureus* were not efficiently ingested in the presence of normal rabbit serum, whereas coagulase-negative *Staph. albus* were rapidly engulfed and inactivated.

Immune sera prepared against a c.p. strain enhanced the ingestion of the homologous, and of three heterologous, strains of *Staph. aureus.* Following phagocytosis, intracellular *Staph. aureus* organisms were promptly killed. The thermostable opsonins in immune sera reacted only with strains of *Staph. aureus.* Polymorphonuclear leucocytes from normal and from immune animals did not differ in their ability either to ingest or kill c.p. staphylococci.

Studies with other bacterial species were described to illustrate: (a) phagocytosis followed by intracellular inactivation; (b) phagocytosis followed by intracellular survival; and (c) the absence of phagocytosis.

Oeding, P. (1959). **Staphylococcal antigen-antibody reactions in agar.** — Acta path.

microbiol. scand. **47,** 53-64. [In English. Author's summary modified.] **610**

Investigations on the antigenic pattern of the staphylococcus strain Wood 46 toxin reacting with alpha-antitoxin have been performed using a double diffusion precipitin technique in agar.

Two bands in the toxin-antitoxin system consisting of at least five very close component lines were probably due to toxic substances. One of these bands (complex 4) consisted of two components, of which the weaker one was identified as the alpha-haemolysin. The significance of the other toxic components remains unexplained.

Four additional lines were found in the toxin-antitoxin system and two more lines in a mixture of toxin and immune serum. The substances responsible for these lines were probably bacterial group antigens.

Durrell, W. B. (1959). **An evaluation of neomycin ointments for the treatment of clinical mastitis in dairy cattle.** — Cornell Vet. **49,** 429-438. [Author's summary modified.] **611**

Five teat-tube ointments were tested in the therapy of 84 cows affected with acute, subacute, or chronic staphylococcal, coliform, or streptococcal mastitis. All contained neomycin with one or more of the following: bacitracin, penicillin, erythromycin, polymyxin, hydrocortisone. One to four tubes were used for each quarter, and in the acute cases systemic medication was added. Most of the cases were subacute. In general these ointments were found to be "fair" for acute mastitis, "good" for subacute mastitis, and "poor" for chronic staphylococcal mastitis.

Plommet, M., Sainclivier, M., Blum, A. & Sevel, B. (1959). Extension en France des mammites à Streptococcus agalactiae. Recherche à partir d'échantillons de lait individuel et de mélange. **[Increase of Streptococcus agalactiae mastitis in France. A study of individual and bulked milk samples.]**—Rec. Méd. vét. **135,** 461-469. [Summaries in English and Spanish.] **612**

Str. agalactiae was recovered, in T.K.T. medium, from 168 (25%) of 660 samples of churn milk, 11 of 40 samples of bulked dairy milk, and the milk of 108 (28%) of 384 cows on farms giving infected churn milk. There was a close correlation between the frequency of infected bulked milk samples from a dairy and the proportion of infected farms supplying it.—M.G.G.

Monti, F. & Ragni, M. (1958). L'associazione antibiotici-prednisolone nella terapia della mastite streptococcica bovina. **[Antibiotic–prednisolone therapy in bovine streptococcal mastitis.]** — Ann. Fac. Med. vet. Torino **8,** 193-204. [Summaries in English, French and German.] **613**

Streptococcal mastitis in 30 cows with 66 infected quarters was treated with 1,000,000 units procaine penicillin G, 1 g. dihydrostreptomycin, 25 mg. prednisolone and distilled water up to 60 ml.; 15 ml. of this soln. was injected into each quarter. Satisfactory results were obtained in 25 animals (52 quarters); local symptoms rapidly disappeared and the milk yield soon returned to normal.—T.E.G.R.

Keller, H. & Boller, H. (1959). Versuche zur Bewertung des Prednisons in Mastitismitteln unter Berücksichtigung des California-Mastitis-Testes. **[Evaluation of prednisone and the California test in mastitis.]**—Schweiz. Arch. Tierheilk. **101,** 444-448. [Summaries in English, French and Italian.] **614**

An antibiotic ointment was instilled into 62 quarters with mastitis, with or without 4·5 mg. of prednisone acetate. Leucocyte counts and results of the California test showed that prednisone did not hasten recovery. The California test is recommended in the diagnosis of mastitis.—M.G.G.

Rømer, O. (1959). **Bovine mastitis due to Streptococcus pneumoniae.**—Nord. VetMed. **11,** 361-374. [In English. Summaries in German and Danish.] **615**

Literature on the subject is reviewed and an account of pneumococcal mastitis in 6 cows is given. The disease was experimentally transmitted to other cows by injection of serum broth cultures into the teat canal. The clinical picture, course and treatment are discussed. From a survey of results obtained by various workers it appears that the majority of cases were due to *Str. pneumoniae* Type 3, which frequently occurs in man. Likely sources of infection are human carriers and milking machines. Hygiene is advocated for the prevention of the disease.—T.E.G.R.

Erlandson, A. L., Jr., Gagliardi, L. A. & Fisher, M. W. (1959). **An experimental enterococcal pyelonephritis in mice.**—Nature, Lond. **184,** Suppl. No. 8. pp. 561-562. **616**

When injected i/v the MGH-2 strain of *Streptococcus faecalis* isolated from the urine of a man, localized in the kidneys of mice. Viable organisms were still present 152 days

later. Only 5% of the mice died and no gross lesions were evident in the kidneys, although microscopic lesions were found. The organism was eliminated from all other organs within 57 days.—A. ACKROYD.

Semple, A. B. & Hobday, T. L. (1959). **Control of anthrax. Suggestions based on survey of imported hides.**—Lancet October 3rd, 507-508. [Authors' summary modified.] **617**

A sampling survey of imported dry hides in Liverpool in 1958 revealed a high proportion of contaminated hides. Yet anthrax is very rare among those handling them. To explain this anomaly, it is suggested that the natural human resistance to anthrax must be greater than is generally supposed. For further protection against the disease, reliance should perhaps be placed on immunization of the workers rather than on the extension of physical precautions.

Albrink, W. S. & Goodlow, R. J. (1959). **Experimental inhalation anthrax in the chimpanzee.** — Amer. J. Path. **35,** 1055-1065. [Authors' summary modified.] **618**

Four chimpanzees were exposed to *Bacillus anthracis* by inhalation of small particle aerosols. Each developed bacteraemia within 2 or 3 days of exposure. Two survived and 2 died. On re-exposure to larger doses, both survivors of the first experiment developed delayed bacteraemia, and one died. There were no clinical symptoms. P.M. findings were comparable to those described for other relatively susceptible lab. animals. Inhalation caused fulminating septicaemia rather than localized pulmonary disease.

Karasu, N. (1959). **The problem of tuberculosis in Turkey.**—Tubercle, Lond. **40,** 275-287. **619**

In Turkey the incidence of TB. is high in man, but low in cattle (only 8% reacted to tuberculin tests in 15 provinces in 1950). Tubercle bacilli were recovered from 0·8% of milk samples and 17·6% of butter samples. Of 2,260 strains isolated from human patients, 6% were of the bovine type. This type was found in 5% of patients with pulmonary TB. and 22% with extra-pulmonary TB.—M.G.G.

Reuter, H. (1959). Ursachen der Reinfektionen in tuberkulosefreien Rinderbeständen. **[Causes of re-infection in tuberculosis-free herds.]**—Mh. VetMed. **14,** 425-427. **620**

The causes of re-infection in 161 dairy herds were, in order of importance, contact with infected draught oxen or with infected cattle at pasture, auctions and animal clinics; TB. in fowls; infected negative reactors; purchase of infected cattle; inadequate disinfection of byres; tuberculous attendants; skim milk for feeding calves; other domestic animals, chiefly goats; and sewage from infected farms.—M.G.G.

Geissler, A. (1959). Der Einfluss von niedrigen und hohen Temperaturen auf die Wertigkeit flüssigen Tuberkulins. **[Influence of low and high temperature on potency of liquid tuberculin.]**—Rindertuberk. u. Brucellose **8,** 115-120. **621**

Freezing reduced the potency of Old Tuberculin and P.P.D. tuberculin. The potency of tuberculin frozen and thawed 6 times decreased by more than half. Potency was not affected by exposure to 64°C. for 16 hours.—M.G.G.

Cole, L. R., Paldino, R. L., Henderson, R. W. & West, A. F. (1959). **Passive transfer of a delayed type of skin reactivity to tuberculin PPD.**—Amer. Rev. respir. Dis. **80,** 398-403. [Summaries in French and Spanish. Authors' summary modified.] **622**

A method has been described for passive transfer, from g.pigs sensitized with tubercle bacilli, to normal animals of a delayed type of skin reactivity to tuberculin PPD. This passive transfer was effected with plasma from which the fibrinogen, gamma globulin, and beta globulin had been removed by alcohol fractionation. The recipients developed skin reactions to tuberculin PPD which had small central areas of yellow necrosis. In three instances recipients had reactions to tuberculin PPD injected intracorneally. [See also *V.B.* **25,** 2665.]

Beer, J. (1959). Ein Beitrag zum Vorkommen und zur Diagnose der Genitalinfektion des Rindes mit Corynebacterium pyogenes. **[Incidence and diagnosis of genital infection with Corynebact. pyogenes in cattle.]** — Mh. VetMed. **14,** 393-396. **623**

There was a high incidence of *C. pyogenes* in samples of genital secretions sent for examination from cattle. The organism was found almost invariably in purulent metritis, and was also isolated from aborted foetuses, preputial secretions and semen. Addition of neomycin increased the frequency of isolation: the organism was demonstrated in 21 of 55 samples when neomycin was added compared to only 13 when it was omitted.—M.G.G.

Murase, N., Suzuki, K. & Nakahara, T. (1959). **Studies on the typing of Erysipelothrix rhusiopathiae. II. Serological behaviours of the strains isolated from fowls including those from cattle and humans.**—Jap. J. vet. Sci. **21,** 177-181. [In English. Summary in Japanese.] **624**

The only avian strain of *E. rhusiopathiae* isolated in Japan was serologically identical with one isolated from fish and showed no cross precipitation with any of the strains from pigs. Of 17 avian strains from the U.S.A. and Canada 9 belonged to Group A, 5 to Group B and 3 had no specific antigenicity. Of 9 strains from tonsils of healthy cattle 4 belonged to Group B, 1 each to Groups C and D and 3 had no specific antigenicity. A strain isolated from a case of bovine endocarditis in Germany and a strain from erysipeloid in man belonged to Group B. It is considered that the higher incidence of avian erysipelas in the U.S.A. and Canada may be due to the inclusion of animal products (meat- and blood-meal) in the diet: in Japan, where the incidence is very low, dried fish is used.—T.E.G.R.

Cooper, M. S. & Allen, G. A. (1959). **The effect of chlortetracycline on the immune response. II. Influence on development of protective antibodies after vaccination with a live, avirulent strain of Erysipelothrix rhusiopathiae.** — J. Immunol. **83,** 232-236. [Authors' summary modified.] **625**

Chlortetracycline was incorporated in the diet of mice before immunization with an avirulent live culture of erysipelas bacilli. The antibiotic was fed continuously for 2 weeks, and was discontinued a week before challenge. There was definite interference with development of immunity. Implications of this interference in some current methods of immunizing livestock were discussed.

Khankishiev, A. M. (1959). **[Listeria infection of sheep and goats in Azerbaijan.]** — Veterinariya, Moscow **36,** No. 6 pp. 35-37. [In Russian.] **626**

Erysipelothrix (Listeria) monocytogenes infection of sheep and goats was first diagnosed in Azerbaijan in 1948. Clinical, serological, P.M. and bacteriological findings are described. On one farm the organism was also isolated from 3 cows that had died.

—M.G.G.

Dorsey, T. A. & Harshfield, G. S. (1959). **Studies on control of fowl cholera.** — Tech. Bull. S. Dak. agric. Exp. Sta. No. 23. pp. 18. **627**

Outbreaks of fowl cholera in South Dakota are usually acute, with high mortality. At least 2 serological groups of *Pasteurella septica* have been determined, which can be identified by their fermentation reactions. Not all symptomless carriers of the infection reacted to blood agglutination tests. Vaccines were unsatisfactory. Oxytetracycline was the most effective antibiotic and was successful in flocks where sulphonamides had failed.

—M.G.G.

Hellmann, E. (1959). Zur kulturellen und morphologischen Differenzierung der Pasteurella multocida. **[Cultural and morphological differentiation of Pasteurella multocida.]** —Zbl. VetMed. **6,** 781-795. [Summaries in English, French and Spanish. English summary modified.] **628**

Forty-two strains, 27 from rodents mostly with disease of the respiratory tract, were classified as proposed by Carter [*V.B.* **27,** 1352] into mucoid (type 1) and smooth (type 2) variants. The mucoid strains had a thick capsule, most smooth strains had no capsule. Thirty-three strains had the same fermentation reactions, while 9 diverged in respect of 1–3 carbohydrates. With mucoid strains the fermentation of indole was often inhibited. In fresh preparations (phase contrast) the organisms could not be distinguished from other Gram-negative bacteria. The bipolar staining is attributable to concentration of cytoplasm at the poles during fixation and staining.

Firehammer, B. D. (1959). **Bovine abortion due to Haemophilus species.**—J. Amer. vet. med. Ass. **135,** 421-422. [Author's summary modified.] **629**

An organism resembling *Haemophilus citreus* was isolated from a 7-month foetus aborted by a dairy cow and from the vagina approximately one month after abortion.

Schebitz, H. & Hansen, H. J. (1959). Über eine durch Salmonella abortus equi verursachte Epididymitis infectiosa beim Eselhengst. **[Infectious epididymitis in donkeys caused by Salmonella abortus-equi.]**—Dtsch. tierärztl. Wschr. **66,** 212-216. [Summary in English.] **630**

Epididymitis in donkeys was often encountered at the Veterinary Faculty of Cairo University. The authors described the features of 15 cases. *S. abortus-equi* was isolated from the testicle in 10 cases. Distribution of *S. abortus-equi* agglutinins was studied in sera from 205 donkeys in the Cairo district and 35

had titres of 1 : 200–1 : 800, while 145 had titres of up to 1 : 100. The epididymitis was always unilateral and occurred more often in the right testicle than the left, suggesting a traumatic origin because the right testicle hung lower than the left in 272 of 658 donkeys. Trauma from harness rope may be a predisposing factor.—R.M.

Raettig, H. (1959). Provokation einer Infektion durch Schutzimpfung. 2. Mitteilung: unspezifische Provokation während der experimentellen Epidemie mit S. typhi murium. 3. Mitteilung: Schutzimpfung in einem endemisch verseuchten Mäusevolk. 4. Mitteilung: Provokation während der experimentellen S. typhi murium-Epidemie nach vorangegangener Immunisierung. [**Provocation of Salmonella typhi-murium infection in mice by immunization. II-IV.**]—Zbl. Bakt. I. (Orig.) **175,** 236-244, 245-257 & 618-631. [Summaries in English, French, Spanish and Russian. For Part I see V.B. **29,** 3060.] **631**

Deaths in mice infected orally with *Salmonella typhi-murium* were more frequent and more rapid if they were inoculated s/c during the incubation period with heat-killed *S. enteritidis. Escherichia coli* antigen had a milder provocative effect, while that of homologous *S. typhi-murium* antigen was much greater.

In groups of mice with latent *S. typhi-murium* or *S. enteritidis* infection or suspected latent virus pneumonia, mortality was higher in those inoculated s/c with heat-killed *S. typhi-murium* than in uninoculated controls. It is considered that immunization increased the virulence of the infecting organisms and that this is a rapid and simple method of detecting latent infections in mice.

Mice were inoculated with killed *S. typhi-murium* both before and after infection with the living organism. Mortality was in general less rapid and lower than in mice inoculated after infection only. It is considered that provocation of infection by immunization during the incubation period is due to the selection of mutant organisms resistant to immunological action.—M.G.G.

Buxton, A. (1959). **The in vivo sensitization of avian erythrocytes with Salmonella gallinarum polysaccharide.**—Immunology **2,** 203-210. [Author's summary modified.] **632**

Intravenous inoculation into fowls of large doses of crude polysaccharide preparations derived from a smooth strain of *S. gallinarum* resulted in adsorption of some of the polysaccharide on the surfaces of circulating erythrocytes. This adsorption, detectable by an antiglobulin haemagglutination test, lasted for a maximum of approx. 24 hours after inoculation of polysaccharide. Sensitization of avian erythrocytes reached a maximum about 8–10 days following oral infection of fowls with the salmonella.

These results are discussed in relation to the ability of the reticulo-endothelial system to remove polysaccharide from the blood stream, and to the possible consequences of the hosts' immunological response to sensitized erythrocytes.

Das, M. S., Chakravorty, M. B. & Ghosh, G. K. (1959). **Occurrence of avian salmonellosis in West Bengal.**—Indian vet. J. **36,** 403-408. [Authors' conclusions modified.] **633**

Both *Salmonella pullorum* and *S. gallinarum* infections in poultry are reported for the first time from West Bengal. An outbreak of *S. aertrycke* infection in pigeons is also reported.

Saurat, P. & Lautié, R. (1959). Sur l'activité de quelques antibiotiques à l'égard de Salmonella pullorum. [**Action of some antibiotics on Salmonella pullorum.**] — Rev. Méd. vét. **110,** 689-701. [Summaries in English and Spanish.] **634**

Neomycin killed nearly all *S. pullorum* organisms at a concentration of 3μg./ml. A combination of 1 μg. neomycin and 1 μg. oxytetracycline had the same effect. Oxytetracycline and chloramphenicol alone were bacteriostatic but not bactericidal at 3–5 μg./ml. Streptomycin had no effect. Four infected fowls received i/m 30 mg. of neomycin and of oxytetracycline twice daily for 2 days and were slaughtered 6 months later. The organism was no longer recovered from the eggs, nor from the organs, but the agglutination titres remained almost unchanged.—M.G.G.

Francis, D. W. (1959). **Failure of furazolidone in a natural infection of Salmonella pullorum in chickens.**—Poult. Sci. **38,** 1204. **635**

Chicks from pullets with natural pullorum disease were fed furazolidone as 0·011% of the ration from hatching to 4 weeks of age. Agglutination tests and bacteriological examination up to the age of 7 months revealed that the infection was not eliminated from all the birds.—M.G.G.

Watkins, J. R., Flowers, A. I. & Grumbles, L. C. (1959). **Salmonella organisms in ani-**

mal products used in poultry feeds.—Avian Diseases **3**, 290-301. [Authors' summary modified.] **636**

Of 200 samples of animal by-products cultured for salmonella, 37 were contaminated, most of them by more than one species: 28 species were isolated.

Heat studies on the contaminated samples demonstrated the susceptibility of the 28 species to a temperature of 65°C. for 35 min. Salmonella organisms were not found in freshly cooked material taken during a personal visit to 7 processing plants. *S. madelia* was isolated from scrapings from the bottom of a percolation vat. It would appear that the organisms are introduced into the by-products as a result of recontamination of the cooked product in the processing plant.

Janney, G. C. & Berman, D. T. (1959). **An evaluation of diagnostic methods for bovine brucellosis in field herds.** — J. Amer. vet. med. Ass. **135**, 371-375. [Authors' summary modified.] **637**

Milk from cows reacting to the sero-agglutination test from herds with positive reactions to the milk-ring test was examined bacteriologically. Although a smaller proportion of the reactors in the herds with slight ring test reactions yielded brucella than reactors from herds with the stronger ring test reactions, a sufficient number of excretors was found in these herds to justify continuation of the present interpretation of ring test results. Tests with acidified plate antigens showed that inhibition of agglutination reactions did not occur at pH 3·8 or higher with the serum of reactors or suspects which yielded brucella on culture. At pH 3·5 or lower, such inhibition was observed.

Agglutination tests with whey, using the ring test antigen, missed a significant number of reactors which were detected by the sero-agglutination test and were positive on bacteriological examination.

Aleandri, M. & Guerra, M. (1959). Indagini sulle reazioni cosiddette aspecifiche nella sieroagglutinazione lenta per brucellosi nei bovini: assorbimento dei sieri con antigene R (metodo di Amarasinghe), agglutinazione con antigene acido (metodo di Roepke e coll.). **[Study of non-specific reactions in the slow agglutination test for brucellosis in cattle: absorption of sera with R antigen, agglutination with acid antigen.]** — Zooprofilassi **14**, 563-578. [Summaries in English and French.] **638**

The method of absorption of non-specific agglutinins by a rough antigen gave inconclusive results; agglutination with acid antigen may be of value as a herd test.—T.E.G.R.

Freund, S. (1959). **[The problem of vaccination with Strain 19.]**—Refuah vet. **16**, 1-2. [In Hebrew. Abst. from English summary (p. 52).] **639**

F. recommended that only calves aged 5–9 months should be inoculated with the vaccine. —R.M.

Pilet, C. (1959). Essai d'immunisation du rat blanc contre la brucellose à l'aide de la souche 45/20, tuée, en excipient irrésorbable. **[Immunization of rats with adjuvant vaccine prepared from killed Brucella abortus Strain 45/20.]** — Bull. Acad. vét. Fr. **32**, 305-312. **640**

Rats inoculated s/c with formolized *Br. abortus* Strain 45/20, in mineral oil and egg yolk, and challenged with virulent *Br. abortus* 3 months later, were at least as resistant as rats immunized with Strain 19. The serum of rats vaccinated with Strain 45/20 did not contain agglutinins.—M.G.G.

Youatt, W. G. & Fay, L. D. (1959). **Experimental brucellosis in white-tailed deer.**—Amer. J. vet. Res. **20**, 925-926. [Authors' summary modified.] **641**

White-tailed deer will develop and maintain a demonstrable titre to *Brucella abortus*. The plate-agglutination test can be used to detect *Br. abortus* antibodies in deer serum; the reaction is identical to that found with bovine serum. Although deer can be infected experimentally with *Br. abortus* it is not known if they are as susceptible as cattle to natural infection. Vaccinated fawns show an antibody response typical of that found in vaccinated calves.

Edgar, D. G. (1959). **The detection of Brucella ovis infection in rams.**—N.Z. vet. J. **7**, 64-66. [Author's summary modified.] **642**

Palpation of the testicles has been compared with bacteriological examination of semen samples as a means of detecting infection with *Br. ovis*. In contrast with findings in experimentally infected rams, palpation proved unreliable in naturally infected rams. Smear examination was superior to culture only, because cultures were sometimes overgrown by contaminating organisms.

Klein, H. (1959). Durch Brucellose bedingte Orchitis beim Hund. **[Brucella orchitis in a**

sheep-dog.]—Rindertuberk. u. Brucellose **8,** 158-162. **643**

K. points out that sheep-dogs must come into contact with brucella infected material, and that in his department the sera of all such dogs are tested as part of the sheep-brucellosis control campaign. He reports the case of such a dog with serum weakly positive 1 : 40, c.f. test strongly positive, Meinicke reaction doubtful, which had orchitis. It was killed and the testes examined bacteriologically and microscopically. Some brucella organisms were found but cultures were overgrown by other organisms. The histological appearances are described in detail and K. states that they differ markedly from those typical for cattle.

—W. K. DUNSCOMBE.

Seelemann. (1959). L'infection des bovins par "Brucella melitensis" en Europe. [**Brucella melitensis infection in cattle.**]—Bull. Off. int. Epiz. **52,** May. pp. 337-347. [Summary in English.] **644**

S. points out the continual extension of *Br. melitensis* infection in cattle in Europe in the last two decades. Although from other parts of northern and western Europe there do not seem to have been any reports, in Schleswig-Holstein a number of cows affected by *Br. melitensis* have already reached the chronic stage as with *Br. abortus;* the organism has not been found in any other animal species including man. He mentioned the isolation of *Br. melitensis* and *Br. intermedia* in Staffordshire (as reported by Stableforth, 1958) where only milch cows have been affected. The organism thus seems to be less pathogenic than *Br. abortus,* but in the south-east of Europe it has not apparently been detected in cattle. [See also *V.B.* **30,** 350.]—W. K. DUNSCOMBE.

Wolz, G. (1959). Die praktische Bedeutung der intradermopalpebralen Brucellinprobe für die Untersuchung von Schafherden. [**The intradermo-palpebral brucellin test for examination of sheep flocks.**] — Rindertuberk. u. Brucellose **8,** 135-138. **645**

In Bavaria between 1951 and 1959, 58 flocks (14,050 sheep) were tested by agglutination (1 : 10, 1 : 20, and 1 : 40 with 5% NaCl), c.f. test (1 : 20 regarded as positive), and with brucellin (0·1 ml. *Br. melitensis* antigen into the lower lid) the test being read after 3–4 days. In 51 flocks 12,600 sheep were negative; in the other seven 1,450 sheep were infected. W. states that in no case was the brucellin test positive alone. 1% of the negative agglutination tests had titres up to 1 : 10.

—W. K. DUNSCOMBE.

Lerche, M. & Entel, H. J. (1959). Der Nachweis lebender Melitensis-Bakterien in Geweben und Organen brucella-ansteckungsverdächtiger Schlachtschafe. [**Demonstration of viable Brucella melitensis in tissues and organs of slaughtered sheep.**]—Berl. Münch. tierärztl. Wschr. **72,** 319-322. [Summary in English.] **646**

In 4 flocks the percentage of sheep positive to serological and allergic tests for *Br. melitensis* infection ranged from 37% to 69%. They were destroyed and the 165 negative reactors were sent for slaughter. Of these, 49 yielded the organism in the uterus, spleen, liver, and in one case the neck muscle. There were no lesions. It is recommended that negative reactors from severely infected flocks should not be sent for slaughter, but be destroyed together with the positive reactors.

—M.G.G.

Heidrich, D. (1959). Untersuchungen über Schweinebrucellose. [**Studies on brucellosis in pigs.**]—Berl. Münch. tierärztl. Wschr. **72,** 375-382. [Summary in English.] **647**

99 pigs at a meat factory were found infected or suspected of brucellosis. Sera of 26 were negative, 7 doubtful (five 1 : 20, and two 1 : 40); 66 were positive, 29 of these gave titres of more than 1 : 320. *Br. suis* was isolated. Macroscopically non-infected uteri can harbour the organism which can also be extra-genital.

In view of the difficulty of isolation of *Br. suis,* several methods should be used in every suspected case.—W. K. DUNSCOMBE.

Beal, G. A., Lewis, R. E., McCullough, N. B. & Claflin, R. M. (1959). **Experimental infection of swine with Brucella neotomae.**—Amer. J. vet. Res. **20,** 872-875. [Authors' summary modified.] **648**

Pigs inoculated i/v with *Br. neotomae* all became infected, and bacteraemia was demonstrated in 2 of 4 pigs inoculated with 1 thousand million organisms and in all of 4 inoculated with 50 thousand million. Bacteraemia in one case persisted for five weeks and in another the organism was isolated from blood culture seven weeks after infection.

Brucella agglutinins developed in all pigs and reached levels of 1 : 100 and higher. The infections were not clinically apparent and at P.M. examination 9–16 weeks after inoculation *Br. neotomae* was not isolated, although 6

animals still had agglutinins.

The characteristics of *Br. neotomae*, including its infectivity for g.pigs, were not altered by residence in tissue of pigs.

Ibáñez, E. A. & Laffont, H. E. (1959). Hallazgo de parasitos del genero borrelia en bovinos. **[Occurrence of borrelia in cattle.]** —Gac. vet., B. Aires **21**, 52-55. **649**

A new species of borrelia, *B. najerai*, between 10 and 20 μ in length, was found in the blood of a bull with concurrent anaplasma and babesia infections.—M.G.G.

White, F. H. & Ristic, M. (1959). **Detection of Leptospira pomona in guinea pig and bovine urine with fluorescein-labeled antibody.** — J. infect. Dis. **105**, 118-123. [Authors' summary modified.] **650**

L. pomona was demonstrated by fluorescein-labelled antibody in the urine and kidneys of experimentally infected g.pigs. Similarly it was regularly demonstrable in the urine of experimentally infected calves during the shedding stage.

This technique proved better than dark-field microscopy. Its advantages over cultural and serological methods for the detection of leptospiral infection are discussed.

van Riel, J. (1959). Les hémolysines leptospiriennes. **[Leptospiral haemolysins.]** — Ann. Soc. belge Méd. trop. **39**, 331-341. [In French. Summaries in English, German, Spanish and Flemish.] **651**

The haemolytic power of 70 strains of pathogenic leptospira was investigated. It is suggested that the haemolytic factor might be used for classifying leptospira.—M.G.G.

Emanuel, M. L. (1959). **The susceptibility of mice to North Queensland strains of leptospirae.**—Aust. J. exp. Biol. med. Sci. **37**, 17-29. **652**

The serotypes found in Queensland produced disease in mice which could be classified as severe, moderate to mild, or inapparent. The severe disease was produced by *L. australia A* and *grippo-typhosa;* the moderate to mild by *L. icterohaemorrhagiae, canicola, australis B*, "Robinson", "Esposito", and *L. hyos;* the inapparent by *L. pomona, kremastos, mini, medanensis* and *celledoni.* Survivors of the first two groups continued to excrete leptospires in the urine probably for the rest of their lives. The author suggests that the pattern of pathogenicity may be characteristic of the serotype.

Mouse inoculation resulted in a slight increase in the number of strains isolated from patients, but did not aid early diagnosis.

—N. Wickham.

Nilakantan, P. R. & Kathuria, B. K. (1959). **A preliminary note on the occurrence of Clostridium welchii type D infection in sheep in India.** — Indian J. vet. Sci. **28**, 197-203. [Authors' summary modified.] **653**

Isolation of eight strains of *Cl. welchii* Type D from sheep suspected to have died from enterotoxaemia is recorded.

A detailed study was made of the cultures and the toxins liberated by them were identified by neutralization tests in rabbits and mice, using standard antitoxic sera.

Cl. welchii Type D was found to be responsible for an outbreak reported as "circling disease" in Madras State.

Butozan, V. & Mihajlovic, S. (1959). La propagation de l'entérotoxémie infectieuse des ovins "enterotoxaemia infectiosa ovum" en Yougoslavie et la lutte contre cette maladie. **[Enterotoxaemia of sheep in Yugoslavia.]**— Bull. Off. int. Epiz. **52**, May pp. 262-268. **654**

Enterotoxaemia of sheep, usually in the subacute form, occurs in all parts of Yugoslavia where there is intensive sheep-farming. Predisposing factors are lush herbage, frost-bitten herbage, cold, and a change of diet. *Clostridium welchii* Type C and D have been incriminated, Type C in the majority of cases. Pregnant ewes are vaccinated with a polyvalent vaccine a month before parturition and again 10–15 days later. After parturition, just before their return to pasture, they are vaccinated against Type D, since enterotoxaemia from this Type occurs in the summer and autumn.—M.G.G.

Vadlamudi, S., Leem, V. H. & Hanson, R. P. (1959). **Case report—botulism type C outbreak on a pheasant game farm.**—Avian Diseases **3**, 344-350. [Authors' summary modified.] **655**

Liver and spleen tissues from diseased pheasants were toxic to a healthy pheasant in which typical signs of botulism were induced. They also produced a fatal toxaemia in mice in 24 hours. The lethal toxin was specifically neutralized by *Clostridium botulinum* Type C antitoxin. The toxin was inactivated by heating to 100°C. for 30 min.

Bacterial and viral agents were not isolated from brain, liver, spleen and blood. Serological and pathological studies excluded

equine encephalomyelitis and Newcastle disease as aetiological factors. Lead poisoning and DDT poisoning were also excluded.

Lamanna, C. (1959). **The most poisonous poison. What do we know about the toxin of botulism? What are the problems to be solved?**—Science **130**, 763-772. **656**

Botulism is discussed in detail. Research, it is stated, has been confined largely to *Clostridium botulinum* Type A toxin, probably because this is the predominant cause of botulism in man. Further research should be directed towards the other types of toxin. Important questions still unsolved are: the role of the toxin in the economy of the producing organisms; the mode of escape of toxins from the alimentary tract; and the mechanism of synaptic poisoning. Such studies also offer the possibility of discovering uses for the toxins as agents in neuro-physiological research. The most urgent task is the isolation of the toxins from extraneous protein in order to facilitate the study of their chemical structure.—T.E.G.R.

Carlquist, P. R. (1959). **A simplified technic for anaerobic culture.**—Amer. J. clin. Path. **31**, 273-275. [Summary in Interlingua.] **657**

A blood agar plate is streaked and placed in an inverted position on the cover which is also placed rim downward. Two pieces of 90 mm. filter paper are placed on the inverted top and spread over with 0·7–0·9 g. pyrogallic acid which is converted into hygroscopic alkaline pyrogallol by spreading 0·1–0·2 g. anhydrous sodium carbonate over it; this will extract the moisture from the medium. The dish is made airtight by ringing it round with hot paraffin. Atmospheric oxygen in the sealed space is soon removed, and that in the Hb or r.b.c. is absorbed as rapidly as it diffuses out of the agar. Within 2 hours the red colour of the fresh blood agar will be replaced by the dark colour of reduced Hb, indicating that the O_2 potential has been lowered sufficiently to permit growth of strict anaerobes.—T.E.G.R.

Te Punga, W. A. (1959). **An indirect haemagglutination test for the detection of Vibrio fetus antibodies. Part 3. Preservation of sensitized erythrocytes.**—N.Z. vet. J. **7**, 72-74. [Author's summary modified.] **658**

A method of preparing a stable r.b.c. suspension modified with *V. fetus* antigens is described. The preparation remained stable for at least six months, without loss of sensitivity or specificity by comparison with sensitized fresh r.b.c. The preserved modified cells were suitable for the detection of antibodies in bovine vaginal mucus.

Cavrini, C. & Gasparini, U. (1959). Sulla presenza delle brucelle e dei micobatteri tubercolari nei formaggi a pasta molle, cruda. **[Brucella and tubercle bacilli in raw fresh cheese.]** — Zooprofilassi **14**, 303-311. [Summaries in English and French.] **659**

One hundred samples of raw soft cheese were tested for brucella and tubercle bacilli by g.pig inoculation. Brucella organisms were not demonstrable in any of the samples and *M. tuberculosis* (bovine type) was demonstrable in one sample. Pathogenic strains of *Escherichia coli* were isolated from some of the g.pigs after inoculation.—T.E.G.R.

Stoenner, H. G., Holdenried, R., Lackman, D. & Osborn, J. S. (1959). **The occurrence of Coxiella burnetii, brucella, and other pathogens among fauna of the Great Salt Lake desert in Utah.**—Amer. J. trop. Med. Hyg. **8**, 590-596. **660**

Q fever organisms were isolated from kangaroo rats *(Dipodomys ordii* and *microps)*, deer mice *(Peromyscus maniculatus)* and ticks *(Dermacentor parumapertus)*. In addition antibodies against the Q fever organism were found in jack rabbits, Northern grass-hopper mice and chipmunks. Other findings were *Brucella neotomae* in desert wood rats *(Neotoma lepida); Br. suis* from jack rabbits *(Lepus californicus); Br. tularensis* from jack rabbits and *Dermacentor* ticks; *Pasteurella pestis* from fleas taken from deer mice.—R.M.

Barlow, A. J. E. & Chattaway, F. W. (1958). **The parasitism of the ringworm group of fungi.** — Arch. Derm., Chicago **77**, 399-405. **661**

A philosophical discussion about the habits and nature of ringworm fungi. The factors which control parasitism in these organisms are not understood and, in the past, progress has been hindered by inadequacy of technique, falsely based deductions, and elaborate and meaningless terminology. During the past decade the need for clearer thinking has been realized.

The authors regard the ringworm fungi as essentially necrophilic, growth being restricted to soft and hard keratin. When growing in keratins removed from the animal body dermatophytes have a saprophytic mode of growth unlike that in the host animal. All persons must be at risk; why so few become

diseased is not clear. Such fungi have been demonstrated in the skin of persons free from lesions.

Duncan (1948) pointed out that generic characters of these organisms have been based on morphology and distribution of the parasites in the infected hair, whilst specific determinations have rested mainly upon the macroscopic characters of colonies vegetating on special culture media. This system, while useful to the clinician, is not acceptable to the mycologist. Barlow and Chattaway recounted the main authors who have dealt with the position, largely since the publication of Sabouraud's work. They gave examples of the unsatisfactory medical nomenclature in text-books and elsewhere.—W.A.P.

Guha, A. N. (1959). **Aspergillus fumigatus infection in goats.** — Indian vet. J. **36,** 252-254. **662**

The organism was repeatedly recovered in culture from granulomatous lesions on the scrotum and inner aspects of the thighs of a goat, which had resisted treatment with dyes and antibiotics. The culture inoculated s/c in another goat produced similar lesions, from which the organism was recovered in culture. —R. N. Mohan.

Martins Mendes, A. (1959). **Preliminary note on the isolation of Asterococcus mycoides from ticks collected from naturally and artificially infected animals with pleuropneumonia.**—Bull. epiz. Dis. Afr. **7,** 155-159. [Summary in French.] **663**

The organism of bovine contagious pleuropneumonia was isolated from *Amblyomma pomposum* ticks collected from naturally or artificially infected animals. Results with other ticks were negative or irregular. The technique used is described and results are given in tabular form.—T.E.G.R.

Knight, G. J. (1959). **Studies with avianised strains of the organism of contagious bovine pleuropneumonia. VI. The appraisal of avianised vaccines with the use of the binomial distribution.**—Bull. epiz. Dis. Afr. **7,** 161-168. [Summary in French. Author's summary modified.] **664**

A method is presented of assessing trials in cattle with bovine contagious pleuropneumonia vaccine. It depends on knowing what proportion of the population from which the sample cattle are drawn, will react to a standard challenge. The criterion of what constitutes a reaction must be rigidly adhered to: in the author's lab. a swelling 4 × 4 in. or greater after the s/c inoculation of a virulent strain of the causal organism was the criterion adopted. It had been estimated that 87% of the cattle used would react to challenge when assessed by this criterion. A table based on this estimate affords a simple method of interpreting results.

The procedure is not as good as a self-contained experiment but does effect considerable economy in the number of cattle required.

Olson, N. O. & Shelton, D. C. (1959). **Control of infectious synovitis. 8. Degree of infection as influenced by medication with furazolidone and chlortetracycline.**—Avian Diseases **3,** 312-321. [Authors' summary modified.] **665**

Six different amounts of infectious synovitis agent were inoculated into the foot pad of chickens to compare the efficacy of chlortetracyline and furazolidone at 50, 100 or 200g. a ton. As the dose of virus decreased, the incubation period was prolonged, the severity of the disease decreased and the efficacy of both drugs increased. Chlortetracycline was more effective than furazolidone in controlling infection.

Benjamin, M. M. & Lumb, W. V. (1959). **Haemobartonella canis infection in a dog.**—J. Amer. vet. med. Ass. **135,** 388-390. [Authors' summary modified.] **666**

After removal of the spleen containing a haemangioma, severe anaemia developed in a dog. In stained smears of the blood, organisms having the morphological characteristics of *H. canis* were demonstrated in the erythrocytes. Transmission of the infection to 2 experimentally splenectomized dogs produced anaemia. Demonstration of characteristic organisms in their blood resulted in the diagnosis of haemobartonellosis.

See also absts. **812** (diseases of chinchillas); **818-819** ("mycotic" stomatitis in cattle); **928** (report, National Institute for Research in Dairying); **929-930** (reports, Australia); **931** (report, W.H.O./F.A.O.).

DISEASES CAUSED BY PROTOZOAN PARASITES

Ashcroft, M. T. (1959). **The sex ratio of infected flies found in transmission experiments with Glossina morsitans and Trypanosoma rhodesiense and T. brucei.**—Trans. R. Soc. trop. Med. Hyg. **53,** 394-399. [Author's summary modified.] **667**

In transmission experiments with *G. morsitans,* using one strain of *T. rhodesiense,* and two of *T. brucei,* the proportion of male flies infected was greater than that of females. In all experiments, female flies died sooner than males. It is suggested that conclusions from experiments using tsetse flies maintained in the laboratory may not be applicable to natural conditions. Field experiments should be carried out.

Groulade, P. & Groulade, J. (1959). Leishmaniose canine. Hématologie et micro-electrophorèse sur papier. **[Haematology and electrophoresis of serum in dogs with visceral leishmaniasis.]**—Bull. Acad. vét. Fr. **32,** 343-351. Discussion: 351-352. 668

A dog with visceral leishmaniasis recovered after treatment with "glucantine", had a relapse after 6 months and recovered after treatment with Lomidine (pentamidine); is was still normal 13 months later. Cutaneous leishmaniasis was observed in another dog. In the visceral form changes observed were a decrease in r.b.c., a marked increase in w.b.c., accelerated sedimentation rate, albuminuria and increased urea in the blood. The course of the disease was followed by electrophoresis, results of which are illustrated and discussed. —T.E.G.R.

Heisch, R. B., Grainger, W. E. & Harvey, A. E. C. (1959). **The isolation of a Leishmania from gerbils in Kenya.**—J. trop. Med. Hyg. **62,** 158-159. 669

Investigations in the Kitui district of Kenya, in 1954, suggested that gerbils and mongooses were reservoirs of infection; *Leishmania* were isolated from them by inoculating hamsters with spleen tissue. Another focus of infection exists round Marigat and in the Kerio Valley. About 10 years ago a man contracted the disease probably while camping in the Kerio valley; very few people live in that area but there are numerous gerbils about 10 miles north of the camp. All gerbils examined were clinically healthy and spleen smears were negative but *Leishmania* were isolated from the spleens of 3 by hamster inoculation. It is considered that the *Leishmania* of gerbils is probably *L. donovani* but its exact status has not yet been determined.—T.E.G.R.

Morini, E. G., Ruiz, G. & Colombo, E. G. (1959). Algunas observaciones sobre la leishmaniosis experimental del cobayo. **[Experimental infection of guinea-pigs with Leishmania enriettii.]**—Rev. Fac. Cienc. vet. La Plata **1,** No. 1 pp. 19-27. 670

Leishmania enriettii was first described in 1948 by Muñiz & Medina [*Arq. Biol. Tec., Curitiba* **3,** 13], who isolated it from spontaneous cutaneous leishmaniasis in Brazilian g.pigs, and have since maintained the organism by passage. The incubation period was 12–15 days after i/d inj., 30 days after i/p inj. Most infected animals died, on the average after 54 days.—R.M.

Clarkson, M. J. (1959). **The life history and pathogenicity of Eimeria meleagrimitis, Tyzzer 1929, in the turkey poult.**—Parasitology **49,** 70-82. 671

The author has previously dealt with *E. adenoeides* [*V.B.* **28,** 3546] and similar methods were used to study *E. meleagrimitis,* isolated from British turkey poults. There were three schizogony cycles followed by a sexual generation. The coccidium caused high mortality and loss of weight in young poults. Resistance developed at 8–10 weeks of age. —R.M.

Hansard, S. L. & Foote, L. E. (1959). **Anemia of induced anaplasmosis in the calf.**—Amer. J. Physiol. **197,** 711-716. 672

The effect of anoplasmosis on the blood picture in 33 calves aged 1–5 months was studied with the aid of radio-iron and radio-chromium and standard haematological methods. The anaemia was caused by depression of blood formation and decreased utilization of iron, rather than increased destruction of erythrocytes. The life span of erythrocytes decreased from an average of 47 days before infection to 15 when the greatest proportion of erythrocytes contained anaplasma bodies and to 6 days after a further ten days.—R.M.

Espana, C., Espana, E. M. & Gonzalez, D. (1959). **Anaplasma marginale. I. Studies with phase contrast and electron microscopy.** —Amer. J. vet. Res. **20,** 795-805. [Authors' summary modified.] 673

Examination by phase contrast and electron microscopy of haemolysed erythrocytes from cattle infected with *A. marginale* has shown this parasite to be more complex than is generally believed. Ring, match, comet, and dumbbell-like forms occur in natural and experimental infections.

A. marginale was motile, a property hitherto undescribed which may be of importance in the classification of the parasite and in explaining the typical marginal position, as well as the mechanism of cell penetration. It seemed justifiable to consider *A. marginale* a

true parasite, probably belonging to the protozoa.

Zlotnik, I. (1959). **Toxoplasma in sheep.** — Lancet September 5th, 295. 674

Reference is made to an editorial and to a paper by Rawal [see *V.B.* **29,** 3801]. It is pointed out that though animal inoculation is superior to other methods for demonstrating toxoplasms, pseudocysts (some of which resemble toxoplasma) are demonstrable histologically in the brains of apparently healthy sheep; though toxoplasma in sheep's brain may be harmless, clinical cases of acute cerebral toxoplasmosis may occur without being diagnosed as such. Histological examination of the brain stem from 150 apparently healthy sheep revealed oval or round cysts in 4. These findings are described and discussed.

—T.E.G.R.

Osborne, H. G. (1959). **Abortion in sheep associated with toxoplasma.** — Aust. vet. J. **35,** 424-425. [Author's summary modified.] 675

In two outbreaks of abortion in ewes in New South Wales lesions of the foetal cotyledons were identical with those seen in toxoplasma abortion in New Zealand [*V.B.* **25,** 1627; **28,** 2459].

In one flock of ewes of all ages 1·6% aborted whilst in a flock of young ewes 11% aborted.

Walzl, H. (1959). Ein Beitrag zur pathologischen Histologie der Toxoplasmose. **[Pathological histology of toxoplasmosis.]**—Wien. tierärztl. Mschr. **46,** 544-546. [Summaries in English, French and Italian.] 676

W. described focal lesions in the lungs of a dog, with pseudocysts present in alveolar walls; also perivascular lesions in the brain of five hens; and lesions in liver, mesenteric lymph nodes and spleen of five hares.—R.M.

Simitch, T., Pétrovitch, Z., Bordjochki, A. & Tomanovitch, B. (1959). Contribution à la connaissance de la virulence de Toxoplasma gondii pour le chat. **[Virulence of Toxoplasma gondii for cats.]**—Arch. Inst. Pasteur Algér. **37,** 286-291. 677

Attempts were made to infect cats of various ages with 3 strains of *T. gondii.* Infection by the oral route was successful in 3 of 25 cats, by introduction into the pharynx in 4 of 9, by the s/c route in 2 of 2, and by the i/p route in 6 of 16. Cats more than 2–3 months old resisted infection.—M.G.G.

Vaccari, I., Ballarini, G., Pieresca, G. & Quaglio, G. L. (1959). Toxoplasmosi spontanea delle lepri in Italia. Toxoplasma gondii in Lepus europaeus Pall. **[Toxoplasmosis in hares in Italy.]** — Nuova Vet. **35,** 73-92. [Summaries in English, German and Spanish.] 678

Spontaneous toxoplasma infection of hares is discussed and an account is given of the gross and histological lesions in 3 hares which had died of natural infection.

—T.E.G.R.

Jones, F. E., Melton, M. L., Lunde, M. N., Eyles, D. E. & Jacobs, L. (1959). **Experimental toxoplasmosis in chickens.**—J. Parasit. **45,** 31-37. 679

Fowls were remarkably tolerant to experimental toxoplasmosis. Birds 10–15 weeks old usually survived intracerebral infection with 100,000 but not with 1,000,000 *T. gondii* per kg. body wt. S/c injection of 100 million organisms per kg. caused only mild fever. Parasitaemia was not found beyond the 8th day after intracerebral infection and the 28th day after s/c infection. Dye test titres did not exceed 1 : 64 and declined rapidly. The muscle of chickens inoculated i/v at 6 weeks of age with 5,000 organisms did not yield the organism beyond the third week after infection. Of 8 laying hens killed 33–41 days after i/v infection with 100 million *T. gondii,* 4 harboured the organism in the liver and brain. Administration of cortisone or a diet deficient in vitamin B_{12} or folic acid did not increase susceptibility.—M.G.G.

Dewes, H. F. (1959). **An occurrence of Balantidium coli in calves.**—N.Z. vet. J. **7,** 42. 680

Balantidium coli was found in the faeces of a calf which showed tenesmus and passed bright blood after faeces of softer than normal consistency; there were lesions of acute ulcerative proctitis. The organism was not recovered from a similarly affected calf on another farm, examined 4 days after it became ill. Both calves were grazing land used by pigs.

—F.E.W.

Jackson, G. J. (1959). **Simultaneous infections with Plasmodium berghei and Trypanosoma lewisi in the rat.**—J. Parasit. **45,** 94. 681

Of 33 rats inoculated i/p with *Pl. berghei* and *T. lewisi,* 8 became infected with *T. lewisi* and 25 with both parasites; 17 of these 25 died from severe anaemia. The infections did not interfere with each other.—M.G.G.

See also absts. **789** (nutrition and susceptibility to infection); **929-930** (reports, Australia).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Ezovitov, N. B. & Brudkov, I. I. (1959). **[Efficacy of vaccination and sanitary measures for control of foot and mouth disease.]** — Sborn. nauch. Trudov Kuïbyshev. vet. Stants. No. 3 pp. 16-31. [In Russian.] **682**

Two epidemics occurred in Kuïbyshev oblast between November 1953 and February 1954, and between August 1955 and September 1956. 96,000 cattle, 8,000 sheep and 7,000 pigs in threatened areas were inoculated with "VIEV" vaccine, 4% subsequently became infected mostly during the first 14 days after vaccination. Results were compared for 13 different batches of vaccine : with 2 batches 73 of 549 animals developed the disease 45–60 days after vaccination.—R.M.

Lucam, F., Fédida, M,. Flachat, C. & Dannacher, G. (1959). Origine et signification des lésions exulcératives de la muqueuse linguale, dans le titrage du virus aphteux, sur boeuf vacciné. **[Origin and significance of the ulcerative lesions on the tongue of vaccinated cattle, used for titrating foot and mouth disease virus.]** — Rev. Méd. vét. **110,** 433-452. **683**

Phosphate buffer containing F. & M. disease virus, when inoculated into the tongue of vaccinated cattle, gave rise to ulcerative lesions at 48% of the inoculation sites which did not develop vesicles. When the buffer soln. did not contain virus the lesions appeared at 36% of inoculation sites. Corresponding figures in cattle not previously vaccinated were 35% and 30%. The lower the virus dilution, the more frequent were the lesions. It is concluded that some ulcerative lesions are of viral, others of traumatic origin. As they cannot be differentiated morphologically, those of traumatic origin will inevitably falsify titrations of F. & M. disease virus. But their number is an indication of the degree of immunity.—M.G.G.

Meier, F. (1959). Untersuchungen über die Zeit des Verbleibs von infektiösem Maul-und-Klauenseuche-Virus in den Organen und seine Ausscheidung bei infizierten Schweinen. **[Persistence and excretion of foot and mouth disease virus in pigs.]**—Mh. Tierheilk. **11,** 109-123. **684**

Nine pigs were exposed to F. & M. disease by contact, and slaughtered after 5–22 days. The virus was demonstrated, by inoculation of unweaned mice, in the feet, back fat, and mucous membrane of the mouth and snout of a pig killed on the third day of illness, and in the mouth and snout of one killed on the fifth day. It was demonstrated in blood serum only up to the second day. In a trial with 13 pigs, nasal secretion and saliva contained virus regularly for the first 3 days of symptoms and occasionally up to the fifth day. Only 3 of these 13 yielded virus in the urine, up to the fifth day. Faeces sometimes contained virus during the first 3 days. Blood neutralization titres rose steeply from the third to the fifth day.—M.G.G.

Kvitkin, Y. P. (1959). **[Physiopathology of experimental foot and mouth disease in reindeer.]**—Veterinariya, Moscow **36,** No. 10 pp. 25-28. [In Russian.] **685**

Clinical features and changes in blood composition were studied in 2 reindeer calves, 4 adults and 18 yearlings, infected with F. & M. virus by scarification of the upper lip. Changes in blood cells and minerals in blood were similar to those observed in cattle infected with the virus. Convalescence was associated with increases in globulin fractions and catalase activity of blood. Reindeer infected in summer had more globulin in the blood than reindeer infected in spring. The disease was mild in housed reindeer and no complications were observed.—R.M.

Paraf, A., Asso, J., Verge, J,. Dhennin, Lo., Dhennin, Le., Dick, P. & Desmoulins, J. (1959). Modifications de certaines propriétés biologiques du virus aphteux observées au cours de plus de cent passages chez le lapin. **[Modification of foot and mouth disease virus during passage in rabbits.]** — Bull. Off. int. Epiz. **51,** 61-63. **686**

Clinical manifestations and P.M. lesions are described, with photographs, in young rabbits inoculated with F. & M. disease virus Type C (Loupoigne). In new-born rabbits flaccidity of the abdominal muscles developed 24 hours after infection, followed by paralysis. At first death occurred 2 days after infection, but after numerous passages it took place within 24 hours. In rabbits over a month old the incubation period was 36–48 hours and death occurred 3–4 days after inoculation; asthenia, but not paralysis, characterized the infection. P.M. lesions in new-born rabbits consisted of occasional petechiae on the muscles, but older rabbits showed degeneration

of skeletal and cardiac muscle. [See also *V.B.* **29,** 2079.]—M.G.G.

Mussgay, M. (1959). Gewinnung einer pH-stabilen Variante des Virus der Maul- und Klauenseuche und ihre Vermehrung in Gewebekulturen mit saurem Medium. [**Obtaining an acid-stable variant of foot and mouth disease virus and its multiplication in tissue cultures with acid medium.**]—Zbl. Bakt. I. (Orig.) **175,** 183-198. [Summaries in English, French, Spanish and Russian.] **687**

Previous work has shown that the virus is rapidly inactivated at pH of 6 or less [*V.B.* **28,** 408]. But M. found a strain of type O_3 virus that would grow in cultures of pig kidney or calf kidney cells at pH 6. After several passages in acid cultures the variant was more resistant to acid than when grown in alkaline cultures. The variant produced larger plaques in acid than in alkaline cultures.—R.M.

Mackowiak, C., Petermann, H. G., Camand, R. & Lang, R. (1959). Un vaccin anti-aphteux trivalent, saponiné, à volume réduit, préparé à partir du virus de culture. [**Concentrated trivalent saponin vaccine against foot and mouth disease, prepared from culture virus.**]—Bull. Acad. vét. Fr. **32,** 313-318. **688**

A trivalent vaccine against F. & M. disease containing 0·5% saponin is described. In cattle inoculated with it antibody titres developed more quickly and were higher and immunity lasted longer than in those given standard aluminium hydroxide vaccine. It has been given to many thousand cattle both in France and in Argentina.—M.G.G.

Bindrich, H., Kuwert, E. & Becker, C. H. (1959). Zur Frage der latenten Tollwut-infektion bei Wildtieren. [**Latent rabies in wild animals.**]—Arch. exp. VetMed. **13,** 579-589. **689**

Mouse inoculation, the c.f. test, and histological examination for rabies were all negative in 383 roe deer, 121 wild pigs and 20 red deer killed in the Greifswald district where rabies was endemic. No suspicious clinical symptoms had been seen. It was concluded that latent rabies in deer and pigs was unlikely, that systematic examination of these animals for rabies was unnecessary, and that further species should be investigated in the search for the reservoir of this disease.—M.G.G.

Dundas-Taylor, B. (1959). **Bovine rabies in Nyasaland. Report on two unusual features.** —Bull. epiz. Dis. Afr **7,** 191-193. [Summary in French.] **690**

In a 19-day-old calf there were nervous symptoms, salivation, constipation and inability to suck. Death, preceded by a rise in temperature, occurred on the 4th day. Negri bodies with well defined inner bodies were demonstrated in the hippocampus by a quick method (which is described); Negri bodies were also demonstrated by the classical method. Diagnosis of rabies was confirmed biologically. In 2 adult cattle rabies was diagnosed histologically; a biological test with the salivary gland of one of these animals gave a positive result.—T.E.G.R.

Sulkin, S. E., Krutzsch, P. H., Allen, R. & Wallis, C. (1959). **Studies on the pathogenesis of rabies in insectivorous bats. I. Role of brown adipose tissue.** — J. exp. Med. **110,** 369-388. **691**

Infections with rabies virus were induced in the bat *Tadarida mexicana,* a quasi hibernator, by the i/m route, and in *Myotis lucifugus,* a true hibernator, by the i/m route or by injection into the interscapular brown fat. The virus was recovered from the brown fat in 23, the salivary gland in 37 and the brain in 91 of 104 *T. mexicana,* and from the brown fat in 18, the salivary gland in 10 and the brain in 55 of 59 *M. lucifugus.* It was also recovered from the brown fat in 27 of 44 infected hamsters. The titres indicated that the virus multiplied in the brown fat. The incubation period was shorter and the virus titres were higher in *M. lucifugus* than in *T. mexicana.* Since the brown fat yielded rabies virus up to 75 days after infection and was the only site of the virus in a few bats, it appears to be a natural reservoir for this agent.—M.G.G.

Powell, H. M. & Culbertson, C. G. (1959). **Action of rabies vaccine derived from embryonated duck eggs against street virus.**—Proc. Soc. exp. Biol., N.Y. **101,** 801-803. [Authors' summary modified.] **692**

Treatment of rabbits with duck-embryo rabies vaccine causes them to withstand otherwise fatal doses of street virus administered intracerebrally. These results with year-old vaccine parallel Semple's original experience with freshly-prepared phenolized vaccine. Human serum following treatment with these vaccines neutralized certain "fixed" viruses and also street virus as tested in white mice.

Luginbuhl, R. E., Sumner, F. W. & Jungherr, E. L. (1959). **A diagnostic test for immunity to avian encephalomyelitis in laying hens.**—

Poult. Sci. **38**, 1223. [Authors' abst. modified.] **693**

It is postulated that the susceptibility of chick embryos to avian encephalomyelitis virus is a measure of the immunity status of the flock.

Ezovitov, N. B. (1959). **[I. Control of equine infectious anaemia in Kuibyshev oblast. II. Recovery from infectious anaemia. III. Immunity in infectious anaemia.]** — Sborn. nauch. Trudov Kuĭbyshev. vet. Stants. No. 3 pp. 95-110; 111-123; 124-140. [In Russian.] **694**

I. E. claimed that infectious anaemia (EIA) was eradicated in the oblast (which covers 54,000 sq. km.) 7 years after introduction of a control programme, described in detail: 76% of premises were free from EIA in the second year (1950) and all were declared free in 1955. The proportion of infected horses was estimated as 36% in 1949 and 0·4% in 1955. A feature of the programme was admission of all horses to a clinic for annual examination.

II. Infected horses kept in isolation were repeatedly examined clinically and haematologically over several years and sera were tested for infectivity by inoculation in foals. E. concluded that in latent and chronic forms of EIA some signs (mainly disturbance of cardiovascular function and erythropenia) persisted for a year or more despite absence of fever. The time required for return to a clinically normal and stable state varied greatly but once the stable state was achieved it was impossible to provoke a relapse. In the author's experience the latent form was of little epidemiological importance.

III. E. demonstrated the presence of sterile immunity in horses recovered from EIA. In addition 15 of 38 horses inoculated simultaneously with EIA virus and immune serum were immune to single or repeated re-infection between a month and 3 years after inoculation. Of the remainder 15 had a mild attack and in 8 the disease was similar to that in unprotected controls. Immunized horses did not excrete the virus, according to results of tests on foals. [This collection of papers also contains articles on excretion of virus in latent EIA (pp. 77–83); epidemiological significance of the latent form (pp. 84–94); and the regional distribution of EIA (pp. 141–148).] —R.M.

Oki, Y. & Fujita, J. (1959). **[Studies on free ferritin in the blood of anaemia-infected horses. III. Influence of circulating ferritin on the clinical symptoms.]**—Jap. J. vet. Sci. **21**, 242-256. [In Japanese. Abst. from English summary. For Parts I & II see V.B. **29**, 3455-6.] **695**

Intravenous inj. of ferritin prepared from horse spleen into horses and goats caused acute symptoms similar to those seen in equine infectious anaemia. Thus some of the symptoms of this disease may be caused by the ferritin liberated from the damaged reticulo-endothelial system.—R.M.

Scott, G. R. (1959). **A précis of the characteristics of rinderpest virus.**—Bull. epiz. Dis. Afr. **7**, 173-178. [Summary in French.] **696**

A brief review of the disease characteristics, and of the physico-chemical and biological properties of the virus.

Scott, G. R. (1959). **Effect of caprinized rinderpest virus in rabbits.**—J. comp. Path. **69**, 423-426. [Author's conclusions.] **697**

The VK strain of caprinized rinderpest virus failed to infect or survive in rabbits.

Easterday, B. C., Hanson, R. P. & Simon, J. (1959). **Experimental viral bovine mastitis.** —Amer. J. vet. Res. **20**, 819-824. [Authors' summary modified.] **698**

An inflammatory reaction was produced in the bovine mammary gland by the infusion of vesicular stomatitis virus, Newcastle disease virus, and vaccinia virus through the teat canal into the udder. These viruses persisted in the mammary gland for varying periods and in most cases stimulated the production of considerable neutralizing antibody. Milk from cows not previously exposed to vesicular stomatitis virus contained a heat-stable substance which inhibited the virus.

That viruses and other non-bacterial agents may induce mastitis should not be overlooked when mastitis problems arise.

Schipper, I. A. & Noice, F. M. (1959). **Intra-herd transmission of mucosal disease.**—Vet. Med. **54**, 442-445. **699**

Experimental transmission was attempted by giving experimental cattle drinking water from barrels used by infected animals and by scarification. Results, based on clinical symptoms, were inconclusive.—T.E.G.R.

Plowright, W. & Ferris, R. D. (1959). **Papular stomatitis of cattle in Kenya and Nigeria.**— Vet. Rec. **71**, 718-722. [Authors' summary modified.] **700**

An erosive stomatitis of cattle in Kenya

may occur independently or complicate the course of rindespest reactions. In Nigeria in 1954–55 a proliferative stomatitis was seen in cattle severely affected by cutaneous streptothricosis. In material from both these conditions it was possible to demonstrate histological changes, similar to those described in 1906 by von Ostertag and Bugge for "stomatitis papulosa bovis specifica." Intracytoplasmic inclusions, similar to those of other pox-group viruses, were also present.

From 4 cases in Kenya, occurring at 3 different times, it was possible to isolate a pox-like virus in cultures of bovine testis cells. These isolates produced intracytoplasmic inclusions.

Reference is made to the importance of papular stomatitis in the differential diagnosis of F. & M. disease and rinderpest. The relationship of this disease to similar conditions reported elsewhere is discussed.

Gillespie, J. H. & Baker, J. A. (1959). **Studies on virus diarrhea.**—Cornell Vet. **49,** 439-443. [Authors' summary modified.] **701**

A strain of virus from an outbreak of virus diarrhoea in Indiana was compared with a strain from New York. Calves from the same herd showed similar signs of illness whichever strain was used for infection. In reciprocal cross-immunity tests in calves, these strains immunized against each other. Both could be propagated in tissue culture; neither caused cytopathic effects. After transfer to rabbits they remained infective for calves. It was concluded that virus diarrhoea as known in New York occurs also in Indiana.

Pascucci, S. & Varani, A. (1959). Contributo allo studio della cherato-congiuntivite infettiva delle pecore. [**Infectious keratoconjunctivitis of sheep.**]—Vet. ital. **10,** 537-549. [Summaries in English, French and German.] **702**

The disease was transmitted to one sheep by conjunctival instillation of conjunctival fluid from infected sheep. Sheep placed in contact with the experimentally infected sheep developed the disease; one gave birth to 2 lambs which developed the disease at 2 days in a mild, protracted form. Experimental transmission to cattle was not achieved. Transmission and cultural tests indicate that the casual organism is probably a rickettsia.

—T.E.G.R.

Hadlow, W. J. (1959). **Scrapie and kuru.**—Lancet September 5th, 289-290. **703**

This interesting article comments on the close similarity between scrapie (affecting sheep) and kuru (a disease of man in the Eastern Highlands of New Guinea) in epidemiological, aetiological, clinical and pathological features. It is not suggested that the two diseases are identical but it is considered that the overall resemblance is too impressive to be ignored. In view of veterinary experience with scrapie, which can be induced experimentally in the sheep and in the closely related goat (but not in other species so far tested) it is considered that it might be profitable to examine the possibility of experimental transmission of kuru to a laboratory primate.

—T.E.G.R.

Palmer, A. C. (1959). **Attempt to transmit scrapie by injection of semen from an affected ram.**—Vet. Rec. **71,** 664. **704**

Semen from a ram with scrapie was injected s/c into 20 day-old lambs. In the course of 2½ years neither these animals nor 14 controls showed clinical signs of scrapie, and histological examination of the medulla of 10 experimental and 9 control animals revealed no significant vacuolation.—M.G.G.

Foggie, A. (1959). **The duration of the immunity in ewes following vaccination against ovine enzootic abortion virus.**—Vet. Rec. **71,** 741-742. [Author's summary modified.] **705**

The immunity to enzootic abortion virus following vaccination with oil adjuvant vaccines was tested at intervals. Challenge of vaccinated ewes during pregnancy 18 months and 30 months after vaccination by inoculation of live virus showed a highly significant degree of immunity. Complement-fixing antibody was present in sera at the 24th month after vaccination but had disappeared at the 36th month. Virus neutralizing antibody was present at the 36th month but absent at the 48th month.

Sharma, R. M. & Bhatia, H. M. (1959). **Contagious pustular dermatitis in goats.**—Indian J. vet. Sci. **28,** 205-210. [Authors' summary modified.] **706**

Two outbreaks of contagious pustular dermatitis amongst Betal goats and kids are recorded. The disease was successfully transmitted to healthy kids and lambs and to one of two calves. Serum-virus neutralization tests showed that goat-pox serum neutralized the virus of contagious pustular dermatitis, but the dermatitis serum failed to neutralize goat-pox virus. These results were confirmed by cross-immunity tests in kids.

The disease was not noticed in animal attendants handling affected animals.

Reuss, U. (1959). Fliegen als Überträger der Schweinepest. **[Flies as transmitters of swine fever.]** — Berl. Münch. tierärztl. Wschr. **72,** 401-402. [Summary in English.] **707**

Swine fever broke out among pigs in a pen 10 metres from an enclosed, sealed compound which housed infected pigs. Dung from the infected pigs was kept in sealed chambers within the compound until it was considered to be non-infective. Within the compound, but not within the dung chambers, flies were controlled by insecticidal sprays. During the hot summer the external door of one of the dung chambers shrank, leaving a gap big enough to admit flies. It was suspected that flies visiting infected dung had transmitted the virus to the healthy pigs.—R.M.

Fuchs, F. (1959). Virusausscheidung bei vakzinierten Schweinen nach ihrem Kontakt mit Schweinepestvirus. **[Excretion of virus by vaccinated pigs after contact with swine fever virus.]**—Arch. exp. VetMed. **13,** 457-466. **708**

101 pigs vaccinated twice with crystal violet vaccine were exposed to swine fever virus in the food or through the scarified skin. 21 excreted the virus in urine and faeces in the following week. It was excreted most frequently on the fifth day after infection. P.M. changes indicative of swine fever in 3 of the excretors and 4 of the other pigs suggested multiplication of the virus.—M.G.G.

Bontcheff, N., Ivanoff, M. & Bojadjieff, S. (1959). Etude comparative de l'action de deux virus lapinisés de peste porcine, sur des truies en gestation et des porcelets en période de croissance. **[Use of lapinized swine fever virus on pregnant sow and young pigs.]** — Bull. Off. int. Epiz. **51,** 252-263. [Summaries in English and Spanish.] **709**

Two strains of lapinized swine fever virus were tested on pregnant sows and on young pigs. Some of the sows aborted and others gave birth to non-viable pigs. The percentage of these accidents was closely correlated with the degree of attenuation of the virus. Virus was demonstrated in material from aborted foetuses and non-viable pigs.—T.E.G.R.

Torrey, J. P., Barney, G. H. & Marmesh, M. (1959). **Crystal violet vaccine experiment, 1956-1957: progress report II.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 271-277. **710**

Report of a 2 year study of the use of crystal violet–glycerol swine fever vaccine. Spring and autumn litters were vaccinated s/c with 5 ml. at 6–15 weeks of age. A number of paired pigs were challenged with virulent virus at either 1, 3 or 6 months after vaccination.

One batch of vaccine prepared from a variant virus gave no protection against its homologous virus.

Of 1,444 pigs challenged 12·25% died in the first year and 6·25% in the second. The results of the vaccine varied considerably but the authors conclude that the pig is the real variable factor in swine fever vaccination. No swine fever occurred in the herds vaccinated, which were as follows:— 1st year 125 herds (11,784 pigs); 2nd year 125 herds (13,117 pigs).—W. K. Dunscombe.

Kötsche, W. (1958). **Extraneural infection of sucking-pigs with the virus of poliomyelitis suum (Teschen disease).**—Acta virol., Prague **2,** 103-112. [In English.] **711**

Infection was set up in new-born pigs, not suckled by their mother, by i/m or i/p injection of virus; the period of incubation was 5–14 days (average 7). In piglets suckled for 1–2 days there was little or no response. This is taken as evidence of natural, non-specific protective substances in the colostrum. Infection was not achieved by the s/c route. In acute infection there was leucocytic neuronophagia in the lateral and ventral horns of the thoracic, cervical and (in those injected i/m) lumbar segments of the spinal cord; in subacute infection there was leucocytic, or leucocytic and glial, neuronophagia in the c.n.s. from the cervical sector of the cord up to and including the diencephalon; in animals in which infection was markedly protracted and which had been suckled only glial neuronophagia was observed, mainly in parts situated orally from the cervical portion of the cord. These findings are taken to indicate ascending spread of virus in the c.n.s. Histological changes were directly related to virus titre. In pigs killed at the height of infection virus was not demonstrable in any except nervous tissue; the virus thus appears to be specifically neurotropic.

—T.E.G.R.

Bourdin, P. & Serres, H. (1959). Vaccinations contre la maladie de Teschen avec le virus de culture. Anticorps et immunité. **[Immunization against Teschen disease with tissue-culture virus.]**—Ann. Inst. Pasteur **97,** 583-589. [Summary in English.] **712**

Vaccine inactivated with 0·15% formal-

dehyde was prepared from cultures of the virus in pig kidney epithelium [see *V.B.* **28,** 1065 & 3591]. Ten piglets aged 10 weeks were each given three s/c inj. of 5 ml. vaccine at intervals of 10 days. Another 10 were similarly inoculated with formolized vaccine plus 1% aluminium hydroxide gel. 20 controls received untreated culture fluid with or without aluminium hydroxide. Twenty days after the third inoculation blood samples were examined for antibodies and each pig was inoculated intracerebrally with 100 lethal doses of virus. Resistance to challenge was evident in 8 of 9 inoculated with formolized vaccine, in all 10 inoculated with formolized adsorbed vaccine, and in 11 of 18 inoculated with untreated culture virus.

Virus neutralizing antibody was present in 2 of 9 pigs given formolized virus, 7 of 10 given formolized adsorbed virus, 8 of 9 given untreated adsorbed virus, and 5 of 9 given untreated virus. 18 of 19 piglets with antibody in the blood resisted intracerebral challenge.

—R.M.

Cohrs, P. (1959). Einschlusskörperchen-Rhinitis beim Schwein. **[Inclusion-body rhinitis in pigs in Germany.]**—Dtsch. tierärztl. Wschr. **66,** 605-607. [Summary in English.] **713**

The rhinitis originally described by Done in England [*V.B.* **26,** 565; **29,** 1783] has since been recognized in Denmark, Canada, the U.S.A. and the U.S.S.R. Cohrs now reports its occurrence in the German Federal Republic: two cases were diagnosed in the Hannover district.—R.M.

Schulze, W. (1959). Beobachtungen über die infektiöse Gastroenteritis der Schweine (Oldenburger Schweineseuche) im Frühjahr 1959. **[Infectious gastro-enteritis in pigs ("Oldenburg pig disease") in the spring of 1959.]**—Dtsch. tierärztl. Wschr. **66,** 415-417. [Summary in English.] **714**

Outbreaks of this disease in North-West Germany early in 1959 are described. It was characterized clinically by copious, malodorous, but not blood-stained diarrhoea, and sometimes vomiting and circulatory disturbances. On slaughter the stomach was filled with dry ingesta, while the intestine was empty. The disease is highly contagious, with an incubation period of 1–3 days and a course of 4–10 days. It is usually fatal in unweaned piglets. The only promising method of treatment is to withhold food and provide plenty of clean drinking water. Treatment with tetracycline and sulphonamides was unsuccessful. In one outbreak the disease was difficult to distinguish from swine fever, both clinically and at P.M. examination.—M.G.G.

I. Nicol, L., Girard, O., Corvazier, R., Cheyroux, M., Reculard, P. & Sizaret, P. (1959). Sérums équins anti-virus de Carré. Production, titrage et utilisation. **[Production of distemper antiserum from horses.]**—Bull. Acad. vét. Fr. **32,** 379-387. Discussion: pp. 388-390. **715**

II. Mackowiak, C., Fontaine, J. & Goret, P. (1959). Préparation d'un sérum contre la maladie de Carré à partir du cheval. **[Production of distemper antiserum from horses.]**—Ibid. 391-395. **716**

I. Certain modifications in the production of hyperimmune serum were rendered necessary by ill effects of the serum on dogs: large, hot, painful swellings leading to sloughing of appreciable amounts of tissue (3 deaths were recorded). Methods of titration are described and results obtained with various methods of serum production are discussed. A serum considered satisfactory was produced by injecting horses with the supernatant fluid of infected tissue cultures. Such serum was harmless after purification and was active against the virus.

II. Ferret spleen or avianized virus was used for the production of distemper antiserum in horses. In the field the serum was active in dogs in a titre equal to, or even higher than, that of homologous serum. Signs of toxicity were not observed even when doses of the heterologous serum were injected s/c.

—T.E.G.R.

Coffin, D. L. (1959). **Cytopathology of canine distemper virus studied by the use of fluorescent antibodies.**—Ann. N.Y. Acad. Sci. **81,** 164-171. **717**

A discussion of previously published work, with 8 photomicrographs. [See also *V.B.* **26,** 3806; **27,** 1766.]—R.M.

Ajmerito, G. C. & Palliola, E. (1958). Contributo clinico ed anatomoistopatologico allo studio delle sindromi meningoencefaliche da cimurro nel cane. **[Meningo-encephalitis in dog distemper.]**—Ann. Fac. Med. vet. Torino **8,** 155-172. [Summaries in English, French and German.] **718**

A few days after inoculation with avianized distemper vaccine a 2-month-old puppy developed fever, anorexia, diarrhoea and a slight cough. On the assumption that the symptoms were due to parasitic infestation the

owner administered an anthelmintic. Progressive nervous symptoms set in—excitement, followed by depression, deviation of the head to the right side, incoordination of movement, ptosis of the upper eyelid of the right eye, visual and auditory disturbances. Examination of the faeces revealed a few *Toxocara canis* eggs. The condition, which terminated fatally, was diagnosed as distemper meningo-encephalitis, probably caused by the vaccine. P.M. findings and histological lesions in the c.n.s. are described and discussed.—T.E.G.R.

Bindrich, H., Kuwert, E., Linsert, H. & Zimmermann, H. (1959). Zur Staupeerkrankung des Nerzes. **[Distemper in mink.]** —Arch. exp. VetMed. **13**, 1-25. 719

From 1955-58, ten outbreaks of distemper were investigated in East Germany and nearly 300 mink examined P.M. The virus was mostly of canine origin as shown by ferret inoculation. Course of disease was either short with apoplectic fits and quick death, or protracted (course 5–7 days). Hypertrophy of foot pads, though common, was not pathognomonic. Thirst may be a feature. While the P.M. findings were according to the course of the disease, enlarged spleen was almost constant. Histological examination revealed inclusion bodies most often in the epithelia of the urinary bladder and air passages. Histological examination in conjunction with the complement-fixation test was the only reliable method of specific distemper diagnosis. The lungs contained the highest proportion of c.f. antigen. Secondary bacterial invasion was uncommon. Differential diagnosis is discussed.

—Irene M. Grisedale.

Pranoto, R. A. (1959). **Macroscopical and microscopical changes produced on the chorio-allantoic membrane of chick embryo by the inoculation of feline infectious gastro-enteritis virus.** — Hemera Zoa **66**, 18-28. [In English.] 720

In the U.S.A. Syverton and others [*J. exp. Med.* **77**, 41 (1943)] failed in two attempts to establish the virus of infectious feline agranulocytosis (feline enteritis) on chorioallantoic membranes of chick embryos. Pranoto isolated a virus from a disease of cats in Indonesia clinically and pathologically similar to the American disease. When this virus was inoculated onto chorioallantoic membrane it caused specific lesions which first became visible 24 hours after inoculation.—R.M.

Litwin, J. (1959). **The growth cycle of the psittacosis group of micro-organisms.** — J. infect. Dis. **105**, 129-160. [Author's summary modified.] 721

The growth cycle of feline pneumonitis virus in the chorio-allantoic ectoderm of chick embryos was analysed from studies on infectivity, particle counts and thin-section electron microscopy. The viral populations were divided into two arbitrary groups: (a) early virus, existing from the time the virus from the inoculum invades the susceptible cells and becomes adapted to the intracellular environment until about 20 hours after inoculation, and (b) late virus, present at the end of the growth cycle, 30 hours after inoculation.

Feline pneumonitis virus was infective to a varying degree throughout its growth cycle. The intracellular virus may exist throughout the growth cycle as discrete particles multiplying by binary fission.

Heinig, A. & Winkler, W. (1959). Beitrag zur Frage der Immunisierung von Kaninchen gegen das Myxomatosevirus. **[Immunization of rabbits against myxomatosis.]**—Arch. exp. VetMed. **13**, 616-624. 722

Rabbits were not immunized against myxomatosis by adsorbed vaccines prepared from skin myxomas or infected chorio-allantoic membranes. Of 102 rabbits inoculated with fibroma virus and challenged 22 days to 6 months later with 1 ml. of 10% myxoma virus suspension 77 survived, though 14 of these 77 had severe myxomatosis. Conjunctival secretion obtained from a symptomless rabbit 11 days after challenge with myxoma virus produced myxomatosis on s/c injection into a healthy rabbit. Three litters born to does infected with myxoma virus were exposed to contact infection and died from myxomatosis. Rabbits immunized with fibroma virus had no c.f. antibodies against myxoma antigen and only seldom against fibroma antigen. Resistance to myxoma virus was not related to antibody titre. No specific antibodies were found in many of the rabbits that were immune to myxoma virus. It is recommended that rabbits should not be immunized with fibroma virus, because of the possibility of creating carriers of myxoma virus. "Stamping out" is the only effective method of control.—M.G.G.

Franklin, R. M. & Wecker, E. (1959). **Inactivation of some animal viruses by hydroxylamine and the structure of ribonucleic acid.** —Nature, Lond. **184**, 343-345. 723

It was observed that hydroxylamine inactivates the infectious ribonucleic acid

extracted from mouse encephalomyelitis virus; it also inactivates other animal viruses which contain ribonucleic acid. It may act on the virus by affecting its protein component, its ribonucleic acid component, or both. Results of experiments to locate the site of action of hydroxylamine are presented.—T.E.G.R.

Hallauer, C. & Kronauer, G. (1959). Weitere Versuche zur Züchtung und Abwandlung von klassischem Geflügelpestvirus in menschlichen Gewebsexplantaten. **[Further studies on cultivation and transformation of classical fowl plague virus in explants of human tissues.]** —Arch. ges. Virusforsch. **9**, 232-250. [Summary in English.] **724**

The "Brescia" strain of fowl plague virus was passaged in human amnion and kidney tissue and HeLa and KB carcinoma cells. The variants were more infective for the explants and less infective for embryonated eggs than the parent strain, and were non-pathogenic and highly immunogenic for fowls. Those adapted to the carcinoma cells remained non-pathogenic and immunogenic for fowls during 13 serial passages in eggs. A reduction in infectivity and immunizing power for fowls appeared after a prolonged series of passages in explants.—M.G.G.

Rusev, C. (1959). **Cultivation of Newcastle disease virus in chick embryonic tissue cultures.** — Acta virol., Prague **3**, 51-55. [In English.] **725**

Newcastle disease virus multiplied rapidly in stationary tubes containing trypsinized cells of whole chick embryos. Suspensions of 4 million cells per ml. yielded higher haemagglutinin titres than those of 1 or 2 million per ml., and higher titres were obtained with a small inoculum of virus ($10^{1.5}$ tissue culture I.D.$_{50}$) than a large ($10^{5.5}$ tissue culture I.D.$_{50}$). pH 7·3 was better than pH 6·8 or 7·9. Cytopathogenicity and pathogenicity for fowls were not affected by over 30 serial passages in tissue culture.—M.G.G.

Jacotot, H. & Vallée, A. (1959). Vaccination contre la maladie de Newcastle au moyen du virus formolé en excipient huileux. (Première note.) **[Immunization against Newcastle disease with formolized virus in oil.]**—Bull. Acad. vét. Fr. **32**, 373-377. Discussion: pp. 377-378. **726**

Formolized Newcastle disease virus incorporated in a mixture of "Arlacel A" and "Mayoline 2214" engendered a solid immunity, lasting over 1 year, in fowls aged 15–18 months; it was well tolerated.—T.E.G.R.

Wilcox, W. C. (1959). **Quantitative aspects of an in vitro virus-induced toxic reaction. I. General aspects of the reaction of Newcastle disease virus with L cells. II. The role of autointerference in the production of cell populations resistant to the cytotoxic effect of Newcastle disease virus.**—Virology **9**, 30-44 & 45-55. [Author's summaries modified.] **727**

I. Addition of large amounts of Newcastle disease virus to monolayers of L cells resulted in a non-transmissible cytopathic effect (which did not occur with virus inactivated by prolonged incubation at 37°C., ultra-violet irradiation, or specific immune serum), characterized by the synthesis of large amounts of non-infective haemagglutinin and an extremely limited synthesis of infective virus: only 10–20% of the infected cell population produced plaque-forming particles, each "yielder" synthesizing from 2 to 3 infective particles. The cytotoxic effect did not appear to depend upon a high multiplicity of infection: there was evidence that the adsorption by a cell of a single infective particle was sufficient for loss of cellular integrity.

II. Large amounts of NDV added to L-cell monolayers caused the destruction of the infected cultures. Small amounts of virus added to similar cultures produced a progressive, spreading reaction without detectable cytopathic effects, and culminated in the production of cell populations which were transiently resistant to challenge with large, cytotoxic inocula of the same agent. This acquired resistance appeared to result from an auto-interference by newly synthesized, non-infective haemagglutinin. Resistant cells, which readily adsorbed virus but did not support further virus synthesis, gradually returned to a normal state of susceptibility to challenge with large amounts of virus. Cultures composed of such cells were frequently observed to contain small amounts of virus which persisted at extremely low levels for extended periods despite repeated washing and subculturing. The amount of free virus in these cultures could be increased by various means.

Sevoian, M. & Calnek, B. W. (1959). **Avian infectious hepatitis. III. Treatment of chickens in egg production.** — Avian Diseases **3**, 302-311. **728**

The authors have previously described a

virus isolated from fowls with hepatitis [*V.B.* **28,** 3253]. It could not be isolated from experimentally infected laying hens that had been given dihydrostreptomycin (250 mg. intramuscularly) 2 or 7 days after inoculation, but was isolated from 15% of birds treated with furazolidone (300 g. per ton of feed for 5–6 days). Inoculation of chick embryos was a more reliable method of isolating the agent than culturing on blood agar. It was isolated from only 40% of infected controls when liver suspensions were inoculated into chick embryos, but when bile was used, it was isolated from all of them. Severely affected birds ceased to lay whereas less affected birds still laid intermittently. Their eggs were of a lower fertility than normal.—A. Ackroyd.

Woernle, H. (1959). Diagnose der infektiösen Bronchitis der Hühner mit Hilfe der Präzipitationsreaktion im festen Agarmedium. [**Diagnosis of avian infectious bronchitis by the gel-precipitin test.**]—Mh. Tierheilk. **11,** 154-167. 729

Antibodies against infectious bronchitis virus were demonstrated in the serum of naturally and experimentally infected fowls by the gel-precipitin test. The precipitins appeared before the neutralizing antibodies. The test could also be used with coagulated heart blood from dead birds and for demonstrating the virus in eggs.—M.G.G.

Webster, R. G. (1959). **Studies on infectious laryngotracheitis in New Zealand.**—N.Z. vet. J. **7,** 67-71. [Author's summary modified.] 730

After experimental infection of birds, the virus could be isolated for only seven days. Rise in antibody titres and cessation of symptoms agreed with this finding.

Four strains of I.L.T. were compared: the virus produced two types of lesions on the chorioallantoic membrane, and a change from small non-neutralized lesions to large neutralizable lesions could occur.

No haemagglutinin or complement-fixing antibody was demonstrable and the virus was not pathogenic for lab. animals.

It multiplied in and was cytopathogenic for tissue cultures of kidney and muscle from day-old chicks. It multiplied to a limited extent in HeLa cells, but without cytopathic action.

Blaškovič, D., Rathová, V. & Borecký, L. (1959). **Antigenic relationships to myxoviruses of a virus isolated from a respiratory infection in ducks.**—Acta virol., Prague **3,** 17-24. [In English. Authors' summary modified.] 731

A virus isolated in Slovakia from ducks with an acute respiratory infection was classified, on the results of haemagglutination inhibition, c.f. and virus neutralization tests and its position in Burnet's receptor gradient, as a new virus of the Myxovirus group, belonging to type A of the influenza viruses, and named A anatis/Košice/1956. [See also *V.B.* **29,** 2088.]

DuBose, R. T. & Grumbles, L. C. (1959). **The relationship between quail bronchitis virus and chicken embryo lethal orphan virus.**—Avian Diseases **3,** 321-344. [Authors' summary modified.] 732

Quail bronchitis virus (QBV) and chick embryo lethal orphan virus (CELO) produced a similar disease in bobwhite quail. Contact transmission was demonstrated with both agents. The viruses could not be differentiated by mortality pattern, dwarfing and gross lesions in chick embryos. Reciprocal serum neutralization studies demonstrated no antigenic differences between them. Aqueous humour was equal or superior to tracheal material as a source for isolation of both agents. CELO was isolated from uninoculated chick embryos. Antibiotics were not necessary to unmask the virus.

QBV, CELO and infectious bronchitis virus were propagated for a limited number of passages in turkey embryos but could not thereby be differentiated. QBV and CELO survived 90 min. at 56°C., whereas 3 known strains of infectious bronchitis virus were inactivated by 30 min.; heat stability may be a rapid method of differentiating QBV (CELO) and IBV. As QBV and CELO could not be differentiated they are considered to be the same agent.

Corrêa, W. M. (1959). Notas preliminares sôbre hepatite a vírus dos marrecos no Brasil. [**Preliminary report on virus hepatitis of ducks in Brazil.**]—Rev. Fac. Med. vet., S. Paulo **6,** (1957) 43-52. [Summary in English.] 733

Virus hepatitis was diagnosed in 107 ducklings received for P.M. examination from the States of São Paulo and Santa Catarina between 1954 and 1957. It was estimated that the disease affected 28% of 20,000 birds. There are 9 photomicrographs of liver lesions. —R.M.

Pontén, J. (1959). **Studies on avian erythroblastosis. I. Morphologic events after induction by a large dose of erythroblastosis virus.** —Acta path. microbiol. scand. **47**, 81-95. [In English. Author's summary modified.] **734**

The progress of the disease was divided into three fairly distinct phases: silent, medullary and extramedullary (or leucaemic). Development of leucaemia was characterized by waves of red cell precursors of increasing immaturity until finally large erythroblasts of a very immature appearance dominated the blood smears. Other changes were slight and consisted in slight terminal anaemia, leucopenia and in one case thrombocytosis.

van Vloten, J. G. G. (1959). Ornithosis bij duiven (de behandeling). **[Streptomycin treatment of psittacosis in pigeons.]** — Tijdschr. Diergeneesk. **84**, 935-938. [Summaries in English, French and German.] **735**

An average of 15% of pigeons submitted for treatment under the Health Service for Carrier Pigeons had c.f. antibodies for psittacosis in their blood. Although pigeons recovered spontaneously from infection after a few months, it was considered that treatment was justified in order to reduce the excretion of virus. For this purpose a subcutaneous inj. of 25 mg. streptomycin sulphate and 25 mg. dihydrostreptomycin sulphate dissolved in 0·5 ml. saline was given; this was repeated after 3 days when necessary.—R.M.

Isaacs, A. (1959). **Action of interferon on the growth of sublethally irradiated virus.**— Virology **9**, 56-61. [Author's summary modified.] **736**

A strain of influenza and one of fowl plague virus after sublethal doses of ultraviolet irradiation were more sensitive to the action of interferon than non-irradiated virus.

See also absts. **660** (R. burneti, brucella and pasteurella from wild animals in Utah); **774** (bovine bladder tumour caused by papilloma virus); **931** (report, W.H.O./F.A.O.).

IMMUNITY

Aladjem, F., Jaross, R. W., Paldino, R. L. & Lackner, J. A. (1959). **The antigen-antibody reaction. III. Theoretical considerations concerning the formation, location, and curvature of the antigen-antibody precipitation zone in agar diffusion plates, and a method for the determination of diffusion coefficients of antigens and antibodies.**—J. Immunol. **83**, 221-231. [Authors' summary modified.] **737**

A method was developed for prediction of whether a zone of precipitation will form for given initial amounts of antigen and antibody. The relationship between diffusion coefficients of antigen and antibody and the curvature of the zone of precipitation was determined. Diffusion coefficients of human serum albumin, bovine plasma albumin and chicken ovalbumin and homologous rabbit antibodies were determined. Values were found to be in reasonable agreement with diffusion coefficients of antigens and antibodies determined by other methods. The outstanding property of this method is simplicity.

Neil, A. L. & Dixon, F. J. (1959). **Immunohistochemical detection of antibody in cell-transfer studies.** — Arch. Path. **67**, 643-649. [Authors' summary modified.] **738**

Lymph node cells from donor rabbits immunized with bovine serum albumin were injected s/c and i/m into recipient rabbits, followed by the radio-iodine labelled antigen, the immune response being measured by the amount of labelled antigen eliminated and the max. concentration of circulating antibody. It appeared that the plasma cells were derived from the transferred lymph node cells. Considering the minimal mitotic activity in the transfer sites it would appear that during their antibody response the transferred lymphocytes metamorphose to the plasma cells without division.

Ingram, D. G., Barber, H., McLean, D. M., Soltys, M. A. & Coombs, R. R. A. (1959). **The conglutination phenomenon. XII. Immuno-conglutinin in experimental infections of laboratory animals.**—Immunology **2**, 268-282. [Authors' summary modified.] **739**

Immuno-conglutinin was stimulated in rabbits after infection with *Erysipelothrix monocytogenes, Salmonella typhi-murium* and other bacteria. Infection of rabbits with Western equine encephalomyelitis, Hammon Reeves virus B.F.S. 283, Murray Valley encephalitis and *Aedes trivittatus* viruses also stimulated the production of this substance. The greatest immuno-conglutinin response followed infection of rabbits with *Trypanosoma brucei.*

Rickettsia burneti infection in g. pigs produced a biphasic immuno-conglutinin response, the first phase coincided with the rise of antibodies to Phase II antigen and the second

phase with the retarded rise of antibodies to Phase I antigen. In mice also the immunoconglutinin level was raised following infection with *Escherichia coli, S. typhi-murium* and other bacteria.

Nyman, M. (1959). **Serum haptoglobin. Methodological and clinical studies.**—Scand. J. clin. Lab. Invest. Suppl. No. 39 pp. 169. [In English.] 740

Aspects of the variation in the concentration of haptoglobin—*i.e.*, the globin-binding fraction of the serum protein—in disease and the effect of impaired liver function on haptoglobin level were studied. An account is given of earlier investigations on the composition of haptoglobin, its interaction with haemoglobin (Hb) and theories on its metabolism and biological function. The Hb-binding capacity of serum is defined and methods for the determination of haptoglobin are described and compared. The effects of disease on haptoglobin were studied and the clinical value of its determination discussed.

—T.E.G.R.

Deutsch, K. (1959). **Coating of red blood cells with antigenic substances.** — Nature, Lond. 184, Suppl. No. 5 pp. 278-279. 741

Electron microscopy showed that the surfaces of r.b.c. become roughened after treatment with a weak solution of tannic acid (1 : 20,000 in saline), and when coated with protein, appear mottled. It is possible that antigenic substances adhere more readily to the roughened surface of tanned r.b.c.

—A. Ackroyd.

Lederberg, J. (1959). **Genes and antibodies. Do antigens bear instructions for antibody specificity or do they select cell lines that arise by mutation?**—Science 129, 1649-1653. 742

This article deals with antibody formation and an attempt is made to formulate an elective theory based on genetic doctrines developed in studies of microbial populations. The following nine propositions (of which the 5th is central to the elective theory) are examined in detail. (1) The stereospecific segment of each antibody globulin is determined by a unique sequence of amino-acids. (2) The cell making a given antibody has a correspondingly unique sequence of nucleotides in a segment of its chromosomal DNA : its " gene for globulin" synthesis. (3) The genic diversity of the precursors of antibody-forming cells arises from a high rate of spontaneous mutation during their lifelong proliferation. (4) This hypermutability consists of the random assembly of the DNA of the globulin gene during certain stages of cellular proliferation. (5) Each cell, as it begins to mature, spontaneously produces small amounts of the antibody corresponding to its genotype. (6) The immature antibody-forming cell is hypersensitive to an antigen-antibody combination : it will be suppressed if it encounters the homologous antigen at this time. (7) The mature antibody-forming cell is reactive to an antigen-antibody combination; it will be suppressed if it first encounters the homologous antigen at this time. The stimulation comprises the protein synthesis and the cytological maturation which mark a "plasma cell". (8) Mature cells proliferate extensively under antigenic stimulation but are genetically stable and therefore generate large clones genotypically preadapted to produce the homologous antibody. (9) These clones tend to persist after the disappearance of the antigens, retaining their capacity to react promptly to its later re-introduction. The first 4 postulates are an extreme but self-consistent set and denial or modification of them would not invalidate the 'elective' theory. The purpose of the last 4 propositions is to account for the general features of antibody formation in general terms.—T.E.G.R.

Franks, D. (1959). **The red cell antigens of the horse. II. Antigens defined by immune isoantibodies.**—J. comp. Path. 69, 353-366. [Author's conclusions. For part I see V.B. 28, 2895.] 743

Seven red cell antigens have been identified by means of antisera from immunised horses, and these have been shown to be independent of the antigens defined by naturally occurring antibodies. It has not so far been possible to place the antigens in allelic series.

It is possible for two horses, both of which possess the same antigen, to differ in the amount of that antigen which is available for reaction with antibody, as demonstrated by the failure of conglutination or lysis to occur with the cells of one of the horses.

The phenomenon of inconglutinability is a property of the antigen and not of the cell itself, and may explain Lehnert's failure to relate antibodies causing lysis to those causing agglutination.

It has been shown that sensitised inconglutinable cells do not fix complement as fully as do sensitised conglutinable cells, and that inconglutinable cells absorb antibody much less

readily. A possible explanation for the failure of the conglutination test is that a certain minimal amount of fixed complement is necessary to produce conglutination or lysis, and that there is insufficient antigen available on the inconglutinable cell to fix this minimal amount of complement, even when the cell is fully sensitised with antibody.

Siskind, G. W. & Thomas, L. (1959). **Studies on the runting syndrome in newborn mice.**—J. exp. Med. **110,** 511-523. [Authors' summary modified.] 744

"Runt disease" was produced by homologous spleen or lymph node cell suspensions, but not by isologous spleen or homologous liver or kidney cell suspensions; the incidence (a) varied with the particular strain combination employed, (b) increased with increased dose of foreign cells, and (c) decreased as the time interval between birth and inoculation with foreign cells was increased. Viable cells were required to produce the condition.

A focal coagulative necrosis was found in the liver of affected mice. There was anaemia of variable degree, and w.b.c. counts ranging from marked leucopenia to severe leucocytosis. Mice receiving isologous spleen or homologous liver or kidney had normal r.b.c. and w.b.c. counts.

Isologous spleen cells, given to new-born mice within 30 min. after injection of homologous spleen cells, conferred significant protection against runt disease. Isologous spleen injected the day after injection of homologous spleen failed to protect. New-born mice which had received homologous spleen cells were protected from the disease by treatment with "anti-cell donor strain" serum. The offspring of mothers which had been immunized against the spleen cell donor's strain remained healthy when treated with homologous spleen cells.

The data are regarded as compatible with the concept, presented by previous workers, that runt disease is the result of an immunological reaction of foreign cells against a tolerant host.

See also absts. **607** (antistaphylococcal agglutinins in pig serum); **610** (staphylococcal antigen-antibody reactions in agar); **621-622** (tuberculin); **624 625** (swine erysipelas); **631, 632 & 634** (salmonellosis); **637-641** (brucellosis); **650-651** (leptospirosis); **658** (vibriosis); **664** (bovine contagious pleuropneumonia); **682-688** (F. & M. disease); **692** (rabies); **693** (avian encephalomyelitis); **694-695** (equine infectious anaemia); **697** (rinderpest); **705** (ovine virus abortion); **708-710** (swine fever); **712** (Teschen disease); **715-717** (dog distemper); **722** (myxomatosis); **725-726** (Newcastle disease); **747** (c.f. test for fascioliasis); **756 762 & 767** (helminth parasites).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Hatch, C. (1959). **Further trials with "Trolene" against warble fly larvae.**—Irish vet. J. **13,** 193-197. [Author's summary modified.] 745

Two further trials using a single oral dose of "Trolene" (ronnel or Dow ET-57) against *Hypoderma* larvae in cattle are described. Dosing in early September on one farm killed all the larvae which arrived beneath the skin of the back. On the other farm with cattle of a different breed dosing in mid-November killed 70–72% of larvae. The dosage was 5 g. per 100 lb. body wt.

Rafyi, A. & Maghmai, G. (1959). La lutte contre les argasides, gale psoroptique et phtiriase des moutons par l'administration des insecticides par la voie buccale. **[Control of ticks, lice and psoroptic mange of sheep by oral administration of insecticides, especially dieldrin.]**—Bull. Soc. Pat. exot. **52,** 39-42. 746

Complete cures were claimed in sheep given, by stomach tube, a single dose of 35 mg. of dieldrin per kg. body wt. for psoroptic mange, and 30 mg./kg. for *Linognathus ovillus* infestation. Mortality in *Ornithodoros lahorensis* and *O. canestrini* fed on sheep treated with 50 mg./kg. 48 hours previously was 100%, declining to 50% after 53 days. Female *Hyalomma* ticks were unaffected. Partial kills were obtained in *O. lahorensis* and *O. tholozani* fed on sheep treated with 250 mg. D.D.T. or 215 mg. "Lexon" [composition not given] per kg.—M.G.G.

See also absts. **667** (sex ratio of tsetse flies infected with T. rhodesiense and T. brucei); **707** (flies as transmitters of swine fever); **929-930** (reports, Australia).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Bénex, J., Lamy, L. & Gledel, J. (1959). Étude de la réaction de fixation du complément à l'antigène distomien chez le mouton. **[Complement-fixation test for liver flukes in sheep.]**—Bull. Soc. Pat. exot. **52,** 83-87. 747

The c.f. test with antigen prepared from *Fasciola hepatica* and *Dicrocoelium dendriticum* was positive in all of 27 sheep excreting ova in the faeces, but also in 9 of 13 sheep and 9 of 31 lambs in which ova were not

found. The apparently false positive reactions may have been due to very mild or recent infection, former infection or cross reaction with other helminths. The test is considered a reliable method of excluding the disease in negative reactors and to have some value in diagnosis.—M.G.G.

Ueno, H., Watanabe, S. & Fujita, J. (1959). **[Studies on anthelmintics against the common liver fluke. I. Action of four halogenated diphenylmethanes and three diphenylsulphides.]**—J. Jap. vet. med. Ass. **12**, 297-301. [In Japanese. Summary in English.] 748

All adult *Fasciola hepatica* were removed from rabbits given 100 mg. of bithionol per kg. by mouth and from sheep given 75–200 mg./kg. *Dicrocoelium* in 2 sheep given 100 mg./kg. were also eliminated. Doses of up to 100 mg./kg. had no side effects. Bithionol acetate was slightly less effective than bithionol in tests in rabbits, and hexachlorophene, though effective, was highly toxic. Dichlorophen, G.5, 4,4′-tetrachlorodiphenylmethane and 2,2′-dihydroxy-5,5′-dichlorodiphenyl sulphide were ineffective. Trials are now being made in cattle. [See also *V.B.* **29**, 3515.]—M.G.G.

Deiana, S., Palmieri, G. & Parriciatu, A. (1959). Azione del siero di bovini normali ed infesti da Schistosoma bovis sulle cercarie del parassita. **[Action of bovine serum on the cercariae of Schistosoma bovis.]** —Boll. Soc. ital. Biol. sper. **35**, 149-150. 749

Serum from normal and from infested cattle was diluted 1 : 1–1 : 640; a suspension containing 15–60 cercariae was added to each dilution and kept at room temp. With both types of serum a slight cercaricidal activity was observed in dilutions 1 : 1–1 : 10; this is ascribed to cercarial vitality being lowered through handling during the experiments. Likewise, precipitation occurred with cercariae undergoing involution.

In the case of serum from infested cattle a pericercarial membrane developed after 5–45 min.; agglutination occurred at an optimum dilution between 1 : 20 and 1 : 80 and was in direct relation to pericercarial activity. The cercaricidal, precipitating, agglutinating and pericercarial activities were reduced by heating at 56°C. for 10 min.—T.E.G.R.

Rapić, S., Baić, D., Jemrić, K. & Malčić, B. (1959). Die Röntgendiagnostik der Schweinefinnigkeit. **[X-ray diagnosis of cysticercosis in pigs.]**—Berl. Münch. tierärztl. Wschr. **72**, 300-303. [Summary in English.] 750

Cysticercosis was diagnosed in live pigs by X-ray photography of the limbs. Mature cysticerci appeared as oval shadows owing to the presence of calcium salts. Immature cysticerci were not detected. The regions of the elbow and popliteal space were the most suitable for examination.—M.G.G.

Maghami, G., Alavi, A. & Khalili, K. (1959). Moniéziose des ovins en Iran et son traitement par l'arséniate de plomb. **[Moniezia infestation of sheep in Iran and treatment with lead arsenate.]**—Arch. Inst. Hessarek **11**, 44-47. 751

Infestation with *Moniezia expansa, M. benedeni, Avitellina centripunctata* and *Helicometra giardi* in sheep in Iran is reported. 20% of infested lambs die. A dose of 0·5 g. lead arsenate was given to each of 209 lambs half of which were infected with *M. expansa.* The faeces of most of these lambs yielded no ova for the next 13 days.—M.G.G.

Segal, M. (1959). "Mal seco", enfermedad de equidos, contribución al conocimiento de su etiopatogenia, observaciones y experiencia en Junín de los Andes (Neuquén). **["Mal seco", a fatal disease of horses in Argentina.]** —Rev. Vet. Milit., B. Aires **7**, 3-10; 66-68; 70-74; 106 & 108-116. 752

A fatal disease of horses in central and southern Argentina is characterized by colic, diarrhoea in the initial stages, coprostasis and progressive emaciation. Constant P.M. findings are aneurysms in the mesenteric arteries and massive infestation with strongyles. Of 250 horses in Neuquén, 65 were given phenothiazine and carbon disulphide in autumn and spring, 65 were given a mineral mixture as well as the anthelmintics and 120 were untreated. Three of the untreated horses died from "mal seco". This group had the severest strongyle infestation. In the 3 that died blood cultures were negative, the blood Ca : P ratio was normal, and no alkaloids were demonstrated in the organs. The soil fertility of the area was good. It is concluded that the disease is caused by strongyle infestation.—M.G.G.

Mioli, M. & Pieracci, F. (1959). Particolare aspetto della trichurosi in suini. **[Pulmonary lesions associated with trichuris infestation in pigs.]** — Zooprofilassi **14**, 315-323. [Summaries in English and French.] 753

Pleurisy and purulent bronchopneumonia with necrotic and gangrenous foci were constant findings in 6 pigs with *Trichuris trichiura.* It is suggested that the larval stage goes through the lungs.—T.E.G.R.

Fernando, S. T. (1959). **Studies on Mecistocirrus digitatus infestation in Ceylon. (A nematode found in the abomasum of ruminants). Class—Nematode: family—Trichostrongylidae (Leiper, 1912).**—Ceylon vet. J. **7,** 19-22. [Author's summary modified.] 754

Of the nematode parasites of the abomasum of cattle in Ceylon *M. digitatus* was the commonest. *Haemonchus* species appeared to be extremely rare in cattle. The diagnostic features of the eggs and third larvae of *M. digitatus* were described.

Silverman, P. H. & Campbell, J. A. (1959). **Studies on parasitic worms of sheep in Scotland. I. Embryonic and larval development of Haemonchus contortus at constant conditions.**—Parasitology **49,** 23-38. 755

Most work on the biology of the stomach worm has been done in South Africa, Australia and the U.S.A. and therefore it has not been proved that control measures effective in those countries are effective in Britain. The authors concluded that in Scotland 2 weeks were required in summer for development from egg to third-stage larva and considerably longer was needed during the rest of the year. Preliminary studies with species of *Ostertagia* and *Trichostrongylus* and *Oe. venulosum* indicated that their cycle of development was even more prolonged and that they were better able to resist adverse conditions. The authors were unable to agree that the strip-grazing system advocated by Spedding [*V.B.* **24,** 4099; **25,** 1397] was necessary to prevent re-infestation with parasitic worms. Advice that a paddock be grazed for 5 days or less and then rested for a month was unsound and possibly dangerous.—R.M.

Ross, J. G., Armour, J., Hart, J. & Lee, R. P. (1959). **Haemonchus spp. X-irradiated larval vaccine in Nigerian zebu cattle.**—Vet. Rec. **71,** 751. 756

Batches of 10,000 *Haemonchus* larvae were each exposed to 60,000 roentgens of X-rays. Twelve parasite-free calves were dosed twice with 10,000 treated larvae, with a month between doses. After 6 weeks 5 vaccinated calves and 6 control calves were challenged with 10,000 normal larvae. P.M. examination 7 weeks later revealed an average of 728 mature and 740 4th stage worms in the vaccinated calves, and 2,624 mature and 383 4th stage worms in the controls. In addition, 300 5th stage worms were found in one of the vaccinated calves. Five other vaccinated calves were placed on infested pasture; results will be reported later.—M.G.G.

Roberts, F. H. S. & Keith, R. K. (1959). **The efficiency of phenothiazine against the immature stages of the bovine stomach worm, Haemonchus placei (Place 1893) Ransom 1911.**—Aust. vet. J. **35,** 38-39. 757

Calves were infested with *H. placei* larvae and groups of 3 were treated with phenothiazine at 0·2 g./lb. body wt. when the worms were from 4 to 42 days old; it was efficient against worms 4, 8, 40 and 42 days old, but worms 14 days old were scarcely affected. Against worms 12 and 16 days old efficiency was only moderate in some animals. Studies on the lifecycle [*V.B.* **27,** 1817] show that 14 days after infestation the majority of the worms would be in the early fifth stage, or in the process of moulting to the fifth stage. Worms of this age appear to be remarkably resistant to phenothiazine. In an outbreak treatment should be repeated at an optimum interval of 10 days.—H. McL. Gordon.

I. Riek, R. F. (1958). **Recent advances in anthelmintics.** — Aust. vet. J. **34,** 370-375. Discussion: pp. 375-382. 758

II. Gordon, H. McL. (1958). **Recent advances in anthelmintics. Opening of discussion.** — Ibid. 375-381. 759

I. Phenothiazine at 20 g./100 lb. body wt. was effective against *Haemonchus placei, Oeophagostomum radiatum* and *Trichostrongylus axei,* but not against *Ostertagia ostertagi, Cooperia* spp. and *Bunostomum phlebotomum.* Higher doses were more effective but were toxic. Although it was effective against *H. placei* 4, 8 and 40 days old, it has very little effect on worms 14 days old.

Toluene (10 ml./100 lb.) given after 60 ml. 10% sodium bicarbonate to close the oesophageal groove, was effective against *H. placei, B. phlebotomum, Cooperia* spp., *O. ostertagi* and possibly *T. axei,* but not against *Oe. radiatum.* Higher efficiency was attained if cattle were deprived of feed and water overnight, and formulation also affects anthelmintic activity [*V.B.* **26,** 162: toluene used in an emulsion].

1 : 8 dihydroxyanthraquinone at 2·5 to 5 g./100 lb. was effective against *H. placei, Cooperia* spp. and *Oe. radiatum,* and probably *O. ostertagi,* but not against *B. phlebotomum* or *T. axei.* At higher dose rates purgation and inappetence occur.

Piperazine hydrate was effective against *Oe. radiatum* at 3 g. per 100 lb., and against

O. ostertagi at 5 g./100 lb., but not against *H. placei, T. axei, Cooperia* spp. or *B. phlebotomum* even at 30 g./100 lb. Piperazine-1-carbodithioic betaine by mouth was not more effective than the hydrate. When injected into the abomasum at 20 g./100 lb. it was highly effective against *H. placei* and *Cooperia* spp.

"Neguvon" (Bayer L13/59) was effective at 1 g./100 lb. against *H. placei;* at 2 g./100 lb. against *Oe. radiatum;* and at 5 g./100 lb. against *B. phlebotomum, Cooperia* spp., and *T. axei.* For high efficiency against *Cooperia* spp. the drug had to be given into the abomasum. It was effective against the immature stages of *H. placei, Oe. radiatum, B. phlebotomum* and *Cooperia* spp, especially when given into the abomasum at 5 g./100 lb. At this dose rate some cattle showed for 2 hours increased respiration, salivation, restlessness and softening of the faeces. Of 200 calves given "Neguvon" only one (dosed at 10 g./100 lb.) died. "Asuntol" (Bayer 21/199) at 0·25 g./100 lb. (the max. safe dose for cattle) was effective against *H. placei, Cooperia* spp., less so against *Oe. radiatum,* and not effective against *T. axei* and *B. phlebotomum.* With higher doses some cattle died. Dow ET-57 at 5 g./100 lb. was highly effective against *H. placei* and *Cooperia* spp., and in some cattle, against *Oe. radiatum,* but not against *T. axei* or *B. phlebotomum.*

It is stated that "phenothiazine delays the acquisition of resistance"; in experimental animals fed continuous doses of larvae *(H. placei),* heavy infestations were established only in those treated monthly with phenothiazine. "It is believed that this is because some influence on resistance is exerted by the mature worms which are susceptible to the drug, thereby permitting the resistant stages (14 days old) to survive in large numbers".

II. "Neguvon" at 2·5 g./100 lb. body wt. was effective against *Haemonchus contortus* in sheep when dosed into the rumen or the abomasum. A dose of 5 g./100 lb. was effective against *Trichostrongylus colubriformis* only when dosed into the abomasum; even 10 g./100 lb. into the rumen was ineffective. Efficiency against *Oesophagostomum columbianum* was variable even at doses (10 g./100 lb.) which were fatally toxic in some sheep. The 2·5 g./100 lb. dose against *H. contortus* sometimes resulted in only a temporary reduction in egg count.

"Asuntol" was highly effective against *H. contortus, T. colubriformis, T. axei* and *Oe. columbianum* when dosed into the rumen, but a dose of 0·25 g./100 lb. was fatal in some sheep. Dow ET-57 at 10 g./100 lb. into the rumen was effective against *H. contortus* but not against other species.

In a field trial with phenothiazine, sheep dosed monthly for 8 months developed resistance to re-infestation at the same time as undrenched controls. There appear to have been more reports of untoward effects following the use of phenothiazine since fine particle material (90% less than 10 μ) has been used. In studies on absorption and excretion 90% of a "coarse" preparation (90% particles greater than 30–40 μ) was recovered, but only 60% of a "fine" preparation (90% particles less than 10 μ).

Very fine phenothiazine (90% less than 2 μ) tested against oxyurids in mice removed only 1·0 to 1·5% of the worms, compared with the average of 35 to 40% removed by coarser material. Even doubling the dose of the very fine material increased activity only to 17%.

There is no clear evidence of resistance to phenothiazine by nematodes of sheep in Australia. Failure of the drug has been seen but is not thought to be due to resistant worms.

A phenothiazine derivative, 2-chloro-7-methoxy phenothiazine, was more effective against oxyurids in mice than phenothiazine, but in sheep it was not as effective.

Piperazines have limited efficiency in sheep; they are very effective against *Oesophagostomum* spp. but not against other species. The high efficiency of the very soluble piperazines against *Oe. columbianum* disposes of the hypothesis that insoluble compounds are essential for anthelmintic activity against the large bowel parasites of sheep.

1 : 8 dihydroxyanthraquinone was effective against all of the large bowel parasites of sheep, including *Trichuris* spp., and against *H. contortus* and *Ostertagia* spp., but not against *T. colubriformis.* Toluene was effective against *H. contortus* only when dosed into the abomasum.

Among the cyanine dyes 1 : 1-di-n-butyl-2 : 2'-carbocyanine iodide was effective against *H. contortus* but not against *T. colubriformis,* and 3 : 3'-diethylthiodicarbocyanine iodide was promising against *H. contortus, T. colubriformis* and *Oe. columbianum.*

Bephenium hydroxynaphthoate was effective against *H. contortus, Oe. columbianum* and *T. axei* when dosed into the rumen and against *T. colubriformis* when dosed into the abomasum. N - butyl - N - phenyldithio -

carbamate had only slight effects on *H. contortus* and *Oe. columbianum.*

The enzyme of the papaw was effective against *H. contortus* but not *T. colubriformis.* Intramuscular injection of carbon tetrachloride was effective against *Fasciola hepatica* in cattle and sheep. Copper methyl arsenate ("Monekil S") was effective against *Moniezia* spp. and *H. contortus* but toxic effects were unpredictable.

In the general discussion there is a report of a field trial in which "Neguvon" was effective only against *H. contortus,* and phenothiazine gave poor results. The efficiency of "Neguvon" against certain species in cattle was confirmed, but a dose of 5 g./100 lb. was essential for high efficiency against *Cooperia* spp., *T. axei* and *O. ostertagi,* and at a dose rate of 4 g./100 lb. there was a mortality of 4 of 16 young cattle.—H. McL. Gordon.

Galvin, T. J., Bell, R. R. & Turk, R. D. (1959). **The efficacy and toxicity of certain organic phosphates and a carbamide as anthelmintics in ruminants.**—Amer. J. vet. Res. **20,** 784-786. [Authors' summary modified.] **760**

Bayer 21/199 ("Co-Ral"), dipterex (Bayer L 13/59), and nicarbazin were tested in calves. The drug 21/199 was effective against parasites in the abomasum and small intestine. Dipterex was fairly effective against abomasal parasites but had little activity against intestinal worms. Nicarbazin was totally ineffective as an anthelmintic. Bayer 21/199 was very toxic for sheep at 25 mg./kg. body wt.

Dorney, R. S. & Todd, A. C. (1959). **Ronnel (Trolene) as an anthelmintic in lambs.** — J. Amer. vet. med. Ass. **135,** 336-338. [Authors' summary modified.] **761**

Trolene (Dow ET-57) given as a single oral dose at 200, 400, and 600 mg. per kg. (active drug) to 22 lambs in two trials had anthelmintic activity, as measured by faecal egg counts, against *Haemonchus, Ostertagia, Stronglyloides,* and *Nematodirus.* Anorexia, diarrhoea, and muscular weakness accompanied the higher dosages, and one of 9 lambs given 600 mg. per kg. died. Lambs should not be given more than 200 mg. per kg.

Jarrett, W. F. H., Jennings, F. W., McIntyre, W. I. M., Mulligan, W., Thomas, B. A. C. & Urquhart, G. M. (1959). **Immunological studies on Dictyocaulus viviparus infection. The immunity resulting from experimental infection.** — Immunology **2,** 252-261. [Authors' summary modified.] **762**

It has been shown experimentally that infection of calves with *D. viviparus* confers a high degree of resistance to re-infection. This acquired immunity can result from a single infection with a sub-lethal dose or from repeated doses of small numbers of larvae. Animals immunized by a previous infection exhibit on challenge a rapid antibody response and a striking reduction (in some cases to zero) in the numbers of worms reaching the lungs, and in the numbers of larvae appearing in the faeces.

Swanson, L. E., Wade, A. E., Senseman, V. F. & Djafar, M. I. (1959). **The efficacy of cyanacethydrazide as a treatment of lungworm, Dictyocaulus viviparus (Bloch), infections in cattle.**—Amer. J. vet. Res. **20,** 777-783. [Authors' summary modified.] **763**

This study did not reveal any significant beneficial effect of treating cattle infected with lungworms with cyanacethydrazide. Statistical analysis revealed no significant decrease in larvae output in the treated animals. The treatment did not save the lives of animals in the later stages of the disease, nor did it alter the gross pathology of the lungs. Weight gains of animals surviving the 87-day field experiment were in favour of the control calves by an average of 27 lb. per head over the treated animals.

Rose, J. H. (1959). **Experimental infection of lambs with Muellerius capillaris.**—J. comp. Path. **69,** 414-422. [Author's conclusions.] **764**

Lambs were infected with *M. capillaris.* No obvious clinical symptoms resulted, but uninfected lambs made better weight gains than infected lambs. Faecal samples, taken at weekly intervals, were examined for first stage larvae. The numbers recovered were not related to the numbers of worms observed in the lungs at autopsy. Adult worms only were present in lambs which received a single infection. Worms in all stages of development were present in lambs which were given infective larvae at frequent intervals. The significance of these findings is discussed.

Guilhon, J. & Petit, J. P. (1959). Essai de traitement de la syngamose des faisandeaux par des préparations anthelminthiques administrées sous forme d'aérosols. **[Treatment of syngamus infestation in pheasant chicks by**

administration of anthelmintics in aerosols.] —Bull. Acad. vét. Fr. 32, 369-372. 765

Clinical syngamus infestation in 43 pheasant chicks was successfully treated by exposure for 15 min. to an aerosol containing a mixture of pyrethrin, rotenone and chenopodium extract at a concentration of 1·58 ml. per cu. metre.—M.G.G.

Pike, E. H. (1959). **The effect of piperazine citrate on hatching and migrating larvae of Ascaris lumbricoides.**—J. Parasit. 45, 46. 766

The tissues of 10 mice dosed orally with piperazine citrate, both before and after oral administration of 5,000 *A. lumbricoides* ova, yielded only 33 larvae, compared with 495 in 10 untreated mice. But when treatment was i/p and began 24 hours after infection the treated mice yielded almost as many larvae as controls (198 and 211).—M.G.G.

Kagan, I. G., Norman, L. & Allain, D. S. (1959). **Studies on the serology of visceral larva migrans. I. Hemagglutination and floocculation tests with purified ascaris antigens.**—J. Immunol. 83, 297-301. [Authors' summary modified.] 767

The following antigens were tested for specificity in the tannic acid haemagglutination and bentonite flocculation tests: (a) ascaris whole worm and tissue saline extracts; (b) polysaccharide whole worm and tissue antigens prepared by ethanol precipitation, and by extraction with formamide; (c) a protein antigen prepared by the method of Melcher. Antisera prepared against ascarid antigens in rabbits, and toxocarid antigens in rabbits, monkeys and a dog, as well as sera from children presumably infected with visceral larva migrans were used to evaluate the specificity of antigens. All except 2 of 14 antigens were serologically active. They were not specific.

Alwar, V. S., Seneviratna, P. & Gopel, S. (1959). **Indofilaria pattabiramani n.g. n.sp. a filarid from the Indian elephant (Elephas maximus), causing haemorrhagic dermatitis.** —Indian vet. J. 36, 409-414. [Authors' summary modified.] 768

The authors described parasitic haemorrhagic dermatitis in elephants in Madras, caused by a filariid, the females of which were described. The helminth was compared with other filariids of elephants. It was distinct from the genera *Parafilaria* and *Dipetalonema*. The authors proposed the creation of a new genus, *Indofilaria,* to accommodate the helminth which they designated *I. pattabiramani.*

Mackerras, M. J. (1958). Catalogue of Australian **mammals and their recorded internal parasites. I–IV.**—Proc. Linn. Soc. N.S.W. 83, 101-160. 769

Part I lists the internal parasites, including protozoa, of the monotremes and marsupials. The only trematode recorded in diprotodont marsupials is *Fasciola hepatica,* an introduced species. The hydatid cyst (*Echinococcus granulosus*) occurs in wallabies and kangaroos.

Part II deals with parasites of the Eutheria, including those introduced by man. The native dog or dingo (*Canis antarcticus*) harbours species similar to those in *C. familiaris.*

The parasites of the introduced Eutheria are the same as those they harbour in other parts of the world, but it is interesting that *Cittotaenia* spp., the common cestode of the rabbit (*Oryctolagus cuniculus*), has not been found in Australia.

Part III lists the parasites of introduced herbivora and the domestic pig. Only 4 species of trematodes have become established, namely *F. hepatica* and 3 paramphistomes inhabiting the rumen and reticulum of sheep and cattle. Three species of adult cestodes occur in the horse and 4 in ruminants. The hydatid parasite occurs in sheep, cattle, goat, pig, horse and camel. Larval stages of other tapeworms (*Cysticercus tenuicollis, C. ovis, C. bovis, C. cellulosae*) are present, but *Coenurus cerebralis* is not present in Australia.

It is interesting to note that with two exceptions there has been no mixing of parasitic groups between introduced herbivores and marsupials although their nematode parasites belong to very closely related groups. The two parasites which have spread to marsupials from domestic animals are *F. hepatica* and *E. granulosus.*

Part IV deals with the parasites of man. Five trematodes, 9 cestodes and 13 nematodes have been recorded from man in Australia. Of these only one trematode (*F. hepatica*) was acquired in Australia. (References to the acquisition of human schistosomes in Australia are somewhat doubtful.) Schistosome dermatitis, due to schistosomes of birds, has been reported. Only 7 species of cestodes (including *E. granulosus* and sparganosis) and 10 species of nematodes were acquired in Australia. *Trichinella spiralis* has not become established, and *Wuchereria bancrofti* is very

rare although a good vector, *Culex fatigans,* is abundant and widespread.—H. McL. Gordon.

Froyd, G. (1959). **The incidence of liver fluke and gastro-intestinal parasites of cattle in Kenya.** — Bull. epiz. Dis. Afr. **7**, 179-182. [Summary in French. Author's summary modified.] 770

Samples were examined from 1,000 cattle of all ages at the Kenya Meat Commission abattoir from the 20th August to 3rd December 1958. Liver fluke, paramphistomes and nematodes were common, cestode eggs rare, and many samples had coccidial oocysts.

Swanson, L. E. (1959). **Leeches (hirudineans) in the teat canals of udders of cattle.** — J. Amer. vet. med. Ass. **135**, 278. 771

Thirty leeches were collected from the milk of a herd of 300 cows in Florida. Five were *Macrobdella ditreta* and one a *Haemopis* sp. They did not cause distress to the cows and were not seen attached to the exterior of the body. It was recommended that ponds in the pasture be drained. The author reports having removed a leech, *Himnatis nilotica,* from the nasal passage of a horse in China. —M.G.G.

Eichler, W. (1959). Der Dok.-Dienst "Angewandte Parasitologie". [**A card index system on applied parasitology, published by the Berlin Institute for Documentation.**] — Mh. VetMed. **14**, 315-317. 772

A card index system covering the literature on parasitology published after 1st Jan. 1957 is described. Each card, the size of a postcard, bears the author, title, date, source and a brief abstract of an article, classification number and subject heading. Subscribers can order all the cards printed or those on certain subjects only. The service is not claimed to be comprehensive on account of wide dispersion of the literature, some of which is difficult to obtain. Its advantages are speed (cards are sometimes despatched in as little as 6 weeks after the receipt of the original articles) and the provision of unbroken series of references. —M.G.G.

See also absts. 789 (nutrition and susceptibility to infestation); 930 (report, Australia).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Cornelius, C. E., Goodbary, R. F. & Kennedy, P. C. (1959). **Plasma cell myelomatosis in a horse.**—Cornell Vet. **49**, 478-493. [Authors' summary modified.] 773

Plasma-cell myelomatosis in a horse was characterized by lameness, weakness, dependent oedema, and macrocytic normochromic anaemia. Paper electrophoretic analysis of serum proteins revealed hypoalbuminaemia and the presence of a beta "myeloma" glycoprotein. In all bones examined there was extensive replacement of normal marrow elements by abnormal cells. Blood and urine analysis and pathological findings are recorded.

Olson, C., Pamukcu, A. M., Brobst, D. F., Kowalczyk, T., Satter, E. J. & Price, J. M. (1959). **A urinary bladder tumor induced by a bovine cutaneous papilloma agent.**—Cancer Res. **19**, 779-782. 774

Submucosal injection of suspension of bovine cutaneous papilloma induced growths in the urinary bladder in 13 of 15 calves. The growths were composed of mucosal polyps and fibroma-like tissues in the submucosa. They were diagnosed by cytoscopy. Six calves were killed between 40 and 81 days after inoculation: the growths varied from 2–3 cm. diameter. No metastases were observed. —R.M.

Guarda, F. (1958). Contributo allo studio dei tumori ovarici. L'arrenoblastoma nella varietà di adenoma tubulare nel suino. [**Ovarian tumours. Arrhenoblastoma in a pig.**]—Ann. Fac. Med. vet. Torino **8**, 9-21. [Summaries in English, French and German.] 775

An account of arrhenoblastoma in the left ovary of a 3-month-old pig. The histology is described in detail (4 photomicrographs). —T.E.G.R.

Dal Santo, F. (1959). Un caso di angio-reticoloma nell'asino. [**Angio-reticuloma in a donkey.**] — Acta med. vet., Napoli **5**, 177-184. 776

Nodules, varying in size from a pea to a walnut, were observed in the spleen of a donkey; they were of two types—reticulo-endothelial and angiomatous. Metastases occurred in the liver. The gross and microscopic appearances are described. There are 5 photomicrographs.—T.E.G.R.

Dal Santo, F. (1959). Reticolo-istiocitoma a plasmodi giganti nel cane. **[Giant-cell reticulo-histiocytoma in a dog.]**—Profilassi **31,** 73-79. **777**

An account is given of giant-cell neoplasia of the pleura, left bronchial node and spleen in a dog. The histology is described and discussed. There are 8 photomicrographs.
—T.E.G.R.

Mastronardi, M. (1959). Su di un caso di plasmocitoma osservato in un cane. **[Plasma-cell tumour in a dog.]** — Acta med. vet., Napoli **5,** 21-34. [Summaries in English and French.] **778**

A 10-year-old male Alsatian dog had continuous fever, diffuse pain and staggering gait for 3 months. Treatment for rheumatism did not cause any improvement and, after about 25 days, swellings appeared on the right scapula, and the middle and upper thirds of the left femur. The condition did not respond to X-ray therapy. Biopsy of the swelling on the scapula and of the sternum revealed numerous atypical plasma cells in various stages of development. On these findings associated with the clinical symptoms and results of blood and urine examination the condition was diagnosed as multiple osteo-myeloid plasma-cell tumour. Coloured photomicrographs are appended.—T.E.G.R.

Morgan, K. G. (1959). **Lymphosarcoma of the thymus of a young cat.**—Vet. Rec. **71,** 823-824. [Author's summary modified.] **779**

Lymphosarcoma of the thymus and mediastinal lymph nodes occurred in an 8-month-old neutered male long-haired cat.

Montemagno, F. (1959). Di un raro caso di leucosi linfatica a decorso acuto in un vitello. (Studio clinico, ematologico, elettroforetico ed etiologico sperimentale). **[Acute leucosis in a calf.]**—Acta med. vet., Napoli **5,** 3-20. [Summaries in English, French, German and Spanish.] **780**

This is an account of acute, fatal leucosis in a calf aged 45 days. Changes in the blood, bone marrow, lymph nodes and spleen are described and compared with those occurring in chronic cases. Electrophoretic study of the serum revealed diminished γ-globulins and involvement of the liver. The aetiology and experimental transmission were studied and results published earlier [see *V.B.* **28,** 2221 and **29,** 3461]. It is claimed that this is the first time that transmission of the disease in calves was achieved.—T.E.G.R.

Papparella, V. (1959). Ricerche sulla recettività della cavia al virus della leucemia linfatica dei bovini. **[Sensitivity of guinea-pigs to the causal agent of bovine leucosis.]**—Acta med. vet., Napoli **5,** 157-176. [Summaries in English, French and German.] **781**

Transmission experiments were carried out on 20 young and 20 adult g.pigs, a group of 10 young and 10 adult serving as control. The test animals were inoculated i/p with amnio-allantoic liquid of 32nd passage in chick embryos; the controls were inoculated with the liquid heated at 60° for 30 min. Susceptibility was high, especially in young g.pigs. Blood examination revealed lymphocytosis, occasional lymphoblasts and a sharp drop in r.b.c. Gross and histological changes occurred and inclusion bodies were observed in neurones and microglial cells. Mortality was low. The virus was recovered from dead g.pigs by chick embryo inoculation.—T.E.G.R.

Agresti, A. (1959). Tentativo di terapia della leucemia linfatica del cane mediante trietilenmelamina (T. E. M.), prednisolone ed A. C. T. H. **[Treatment of canine leucosis with triethylene melamine, prednisolone and A. C. T. H.]**—Acta med. vet., Napoli **5,** 35-54. [Summaries in English, French and Spanish.] **782**

Treatment of lymphatic leucosis is reviewed and an account is given of the condition in a 4-year-old dog. Good results were achieved by treatment based on triethylene melamine, prednisolone and corticotrophin, associated with antibiotics and vitamins.
—T.E.G.R.

Biely, J. & March, B. E. (1959). **Genetic and nutritional effects on the incidence of the avian leucosis complex.** — Poult. Sci. **38,** 1103-1109. [Authors' summary modified.] **783**

The incidence of the avian leucosis complex was studied in two generations of two strains of White Leghorns maintained on different levels of nutrition. A control experiment using birds of known susceptibility to leucosis was also included. The diets used within the two planes of nutrition were not extreme. Growth rate was somewhat retarded in the chicks on the low level, egg production was similar with the low and the high level and hatchability was depressed on the low level nutrition.

From the data obtained on the incidence of mortality from leucosis, two of the strains were termed susceptible and two resistant. With all strains the incidence of leucosis was

greater when the birds were on the high level of nutrition.

Lloyd, G. L. (1959). **Avian leucosis complex is probably inherited.**—Rhod. agric. J. **56,** 155-156. **784**

Records of the flock of chickens at the Gwebi Agricultural College indicate that in the avian leucosis complex heredity plays a larger part than infection in spread. Intensive selection against susceptible families can reduce the mortality from the disease to about 5%.

—A. Ackroyd.

Phillips, T. A. (1959). **Leukaemia and geography.** — Lancet October 24th, 659-661. [Author's summary modified.] **785**

In five counties (Cumberland, Westmorland, Caernarvon, Montgomery, and Monmouth) leucaemia death-rates in man have been rising rapidly, the rise being over 50% in two successive four-year periods.

The rates prevailing in these counties were all above the mean for England and Wales in 1957, but taken on a four-year basis only Montgomery has an outstandingly high death-rate (10 per 100,000), the highest in the two countries.

A possible cause is radiostrontium fallout, and more research is indicated, especially into the levels of radiostrontium in bones of leucaemia patients from mountainous western counties.

See also abst. **933** (book, soil, grass and cancer).

NUTRITIONAL AND METABOLIC DISORDERS

Williams, V. J. & Christian, K. R. (1959). **Blood chemistry and haematology in sheep in a sudden decrease in food intake.**—N.Z. J. agric. Res. **2,** 677-682. [Authors' summary modified.] **786**

Twelve dry, non-pregnant ewes were individually penned for 47 days and fed dried grass of uniform composition. After 19 days on 1,000 g./day, the ration was reduced overnight to 300 g./day for the remainder of the trial. Live weights after 19 days on 1,000 g. averaged 113 lb., and at the end of the test period 96 lb. The sudden reduction in feed caused no significant change in blood sugar, keto acids, ketone bodies, amino-acid nitrogen, non-protein nitrogen, inorganic phosphorus, serum calcium, serum magnesium, percentage neutrophiles, percentage lymphocytes, haemoglobin, or haematocrit.

Annison, E. F., Lewis, D. & Lindsay, D. B. (1959). **The metabolic changes which occur in sheep transferred to lush spring grass. I. Changes in blood and rumen constituents. II. Changes in the acid base balance of the whole animal.** — J. agric. Sci. **53,** 34-41 & 42-45. [Authors' summaries modified.] **787**

I. Changes are observed in the concentrations of a wide range of substances found in blood and rumen contents when sheep are first turned out to lush spring grass. With some metabolites (rumen alpha-amino nitrogen, blood volatile fatty acids) the increase is only temporary, and the animal (or its rumen micro-organisms) quickly adapts itself to the changed conditions. With other metabolites, such as rumen volatile fatty acids, there is a sustained increase over a period of at least three weeks on grass. The nature of the previous diet may determine the magnitude of the metabolic changes.

The overall nature of these changes should be taken into account in assessing the aetiology of the metabolic diseases occurring in ruminants under similar conditions.

II. Acid-base changes were observed in the blood of some sheep after turning them out to lush spring grass; they occurred in animals previously fed hay plus concentrates, and not in those previously fed hay alone. Reasons are given for believing that the acidosis was a consequence of feeding on lush pasture, and not a result of the exercise and excitement involved in rounding up sheep for sampling.

Dubos, R. J. & Schaedler, R. W. (1959). **Nutrition and infection.** — J. Pediat. **55,** 1-14. **788**

A review of the beneficial and adverse effects of nutritional factors on infections. A few have a specific protective effect, for instance cobalt against staphylococci in mice ingesting excessive manganese, and greenstuffs against TB. in g.pigs. Others, such as lysine and vitamin C, increase the response to infective agents. Dormant infections can be activated by nutritional deficiencies, for instance pseudotuberculosis in mice lacking pantothenate. Deficiencies in proteins and amino-acids aggravate bacterial infections and this effect may be due, not to interference with the destruction of bacteria nor to increased bacterial multiplication, but to low resistance to bacterial toxins;—in mice fed adequate and

deficient diets the numbers of bacteria recovered 48 hours after infection were the same, and mice fed a diet poor in protein were highly susceptible to avirulent staphylococci injected with bacterial endotoxin. Resistance to infection may be increased by nutritional deficiences, such as riboflavin deficiency in chicks with *Plasmodium lophurae* infection.
—M.G.G.

Euzéby, J.-A. (1959). Alimentation et réceptivité des animaux aux maladies parasitaires. **[Role of nutrition in susceptibility of livestock to parasitic diseases.]**—Bull. Off. int. Epiz. **52,** May pp. 168-197. [Summaries in English, Italian and Spanish.] **789**

Susceptibility to intestinal parasites is affected by lesions of the alimentary mucosa caused by hard particles, plant poisoning, alteration of the intestinal pH and nutritional deficiencies or excesses. Sometimes the parasites themselves are adversely affected, for instance, *Eimeria tenella* by folic acid deficiency, and *Plasmodium gallinaceum* by pantothenic acid deficiency. Control of coccidia and helminth infestations by the inclusion of milk in the diet, and the possibilities of antivitamins are discussed.—M.G.G.

Henry, M. (1959). Répercussions des quantités d'eau ingérée sur l'aldostéronurie chez le porc. **[Influence of quantity of water ingested on aldosterone content of urine in pigs.]**—C. R. Soc. Biol., Paris **153,** 762-764. **790**

Two pigs weighing 80 kg. each received 10 litres of water daily in the ration for 12 days, and 2 control pigs each received 6 litres. The aldosterone content of the urine rose in the experimental pigs and decreased in the controls. It is suggested that feeding pigs of 80–100 kg. daily on up to 15–20 litres of whey from cheese factories may predispose them to exudative depigmenting myopathy.—M.G.G.

Migicovsky, B. B. (1959). **Removal of strontium and caesium from milk.**—Nature, Lond. **184,** Suppl. No. 6. pp. 374-375. **791**

The resin, "Dowex 50*W*–*X*12", treated with calcium, potassium and sodium, was used in experiments on commercial milk to which strontium-89 had been added and on g.pig milk containing strontium-89 diluted with cow's milk. There was no change in the flavour or in the Ca, K or Na content of the milk and 86% of the strontium was removed by one treatment. The same resin removed 76% of the caesium-137 that had been added to milk. These results indicate that the isotopes can be removed from the milk, which remains unaltered; the question requiring further investigation is whether the process could be put on a commercial basis if the necessity arose.—T.E.G.R.

I. Shaw, R. A. & Jackson, H. D. (1959). **Isolation of a respiratory inhibitor from alfalfa.** —Arch. Biochem. **84,** 405-410. **792**

II. Jackson, H. D. & Shaw, R. A. (1959). **Chemical and biological properties of a respiratory inhibitor from alfalfa saponins.** —Ibid. 411-416. **793**

I & II. Previous studies showed that lucerne capable of causing bloat in cattle contained a substance which inhibited respiration of rat diaphragm muscle [*V.B.* **28,** 515; **29,** 2886]. The substance was isolated from the insoluble portion of dried lucerne by ethanol extraction followed by ion-exchange chromatography. It appeared to be a saponin.—R.M.

I. Allen, K. A., Stephens, J., Jaffe, W. P. & Wakelam, J. A. (1959). **Unidentified growth factors.**—Nature, Lond. **184,** Suppl. No. 5. pp. 271-272. **794**

II. Wakelam, J. A. & Jaffe, W. P. (1959). **Unidentified chick growth factors.**—Ibid. p. 272. **795**

I. When the diet of chicks was supplemented with malt distillers' dried solubles, or procaine pencillin, growth was enhanced and there was a shift in the duodenal bacterial flora in favour of a lactobacillus type. Growth of cultures of the predominant type of lactobacillus was promoted by malt and molasses distillers' dried solubles. Chicks, and lactobacilli, gave roughly comparable growth responses to both additives.

II. Increased growth due to an unidentified growth factor was observed in chicks after the diet was supplemented with dried yeast or whey, or molasses distillers' dried solubles, but not with fish meal. The response was most marked with distillers' dried solubles and its extent correlated well with that observed with lactobacilli in a microbiological assay for comparing sources of growth factors.
—A. Ackroyd.

Gasparini, G. & Roncalli, R. (1959). Studi comparativi della penicillina procaina e della fenossimetilpenicillina a varî livelli sull'incremento ponderale e sull'indice di conversione alimentare nel pollo da carne. **[Comparative study of the effects of procaine penicillin and phenoxymethyl-penicillin on weight gain and food conversion rate in broilers.]**—Veter-

inaria, Milano, **8**, 147-149. [Summaries in English, French, German, Spanish and Portuguese.] **796**

Procaine penicillin caused a continued increase in weight gain and improved the food conversion index. With phenoxymethyl penicillin there was only an initial increase in weight gain and no improvement in food conversion.—T.E.G.R.

Hazelwood, R. L. & Lorenz, F. W. (1959). **Effects of fasting and insulin on carbohydrate metabolism of the domestic fowl.**—Amer. J. Physiol. **197**, 47-51. **797**

The authors studied changes in glucose content of blood and heart muscle following starvation or injection of insulin. Hyperglycaemia caused by insulin was not caused by its glucagon content.—R.M.

Englert, H. K., Kopp, C. & Dietrich, G. (1959). Über die Morenkrankheit im Schwarzwald. **[A disease of pregnant and lactating sows in the Black Forest, associated with protein deficiency.]** — Dtsch. tierärztl. Wschr. **66**, 485-490. [Summary in English.] **798**

A usually fatal disease of pregnant and lactating sows, which has occurred for many years in the Black Forest and was thought to be infectious, was now believed to be due to protein deficiency. Electrophoresis of blood sera revealed a low albumin/globulin ratio (about 1 : 4). The symptoms were refusal to eat, rapid breathing, strong, rapid pulse beats, and reddening of the skin. P.M. examination revealed degeneration of the heart muscle, congestion in most organs; histologically, the adrenal glands were depleted of sudanophilic substances. Incidence was highest in summer. Outbreaks were controlled by increasing the protein content of the diet and administering cortisone and ACTH. It was considered that protein deficiency caused a failure of the pituitary-adrenal system.—M.G.G.

McTaggart, H. S. (1959). **"Milk lameness". an aphosphorosis of heavy-milking cows.** — Vet. Rec. **71**, 709-714 & 715. [Author's summary modified.] **799**

"Milk lameness" occurred in 9 cows in a lowland Ayrshire herd in autumn 1958. Typically the condition occurred in the higher-yielding cows, being characterized by hip lameness and hypophosphataemia. Evidence is presented that although the P-content of the herbage was probably normal, the cows could not acquire enough P from unsupplemented grazing to meet their production needs. The possible parts played by excessive rainfall, lack of sunshine and vitamin D, and by a Mg supplement in accentuating the deficiency and its effects are discussed. A supplement of sterilized bone flour (½ oz. per head per day) resulted in the disappearance of the clin. manifestations and the return of the blood inorganic P level to normal within 5 weeks.

Skerman, K. D. (1959). **The correction of cobalt deficiency in lambs.**—Aust. vet. J. **35**, 369-373. [Author's summary modified.] **800**

Correction of cobalt deficiency in lambs by use of cobalt "bullets" or by top-dressing with cobalt sulphate was assessed on a farm where cobalt deficiency occurred annually. On untreated pasture the difference in weight gains between lambs dosed with "bullets" and controls was significant. On top-dressed pasture, lambs dosed with "bullets" gained more weight than untreated controls but the difference was not significant. Top-dressing with 16 oz. cobalt sulphate per acre appeared effective for about 18 months. Response to cobalt was less in ewe lambs than in ram lambs.

Aikawa, J. K., Rhoades, E. L., Harms, D. R. & Reardon, J. Z. (1959). **Magnesium metabolism in rabbits using Mg-28 as a tracer.**—Amer. J. Physiol. **197**, 99-101. **801**

Magnesium chloride labelled with Mg^{28} was injected i/v or i/p. Concentrations of Mg in blood, urine and tissues were measured at intervals between 2 and 24 hours after injection. Plasma clearance was rapid. Accumulation in bone commenced within 2 hours. The lowest concentrations were found in skin and skeletal muscle.—R.M.

Peirce, A. W. (1959). **Studies on salt tolerance of sheep. II. The tolerance of sheep for mixtures of sodium chloride and magnesium chloride in the drinking water.**—Aust. J. agric. Res. **10**, 725-735. [Author's summary modified. For Part I see V.B. **28**, 1165.] **802**

Seven groups, each of 6 sheep, were fed in pens for 16 months on chaffed lucerne and wheat hays. One group was offered rain-water to drink, another 1·3% sodium chloride, and the others mixtures of different proportions of sodium and magnesium chlorides. Many refused to eat or drink satisfactorily when the saline waters were first offered unless the concentrations were increased gradually over 3 weeks. Intake of water containing 1·3% NaCl was higher than that of rain-water, and increased with increasing conc. of $MgCl_2$ up to

0·1%. Intake in the hottest months was nearly double that in the coldest months.

A conc. of 1·3% NaCl and concentrations of up to 0·1% $MgCl_2$ with 1·2 or 1·3% NaCl had no adverse effect on sheep, but 0·2 or 0·5% $MgCl_2$ (with 1 and 0·7% NaCl respectively) caused reduction in food consumption and occasional diarrhoea. The saline waters had no effect on Na, K, Ca or chloride in the blood plasma, but Mg was significantly higher in plasma of sheep which received 0·5% $MgCl_2$.

McLean, J. W., Thomson, G. G. & Claxton, J. H. (1959). **Growth responses to selenium in lambs.**—Nature, Lond. **184,** 251-252. **803**

In the south island of New Zealand a condition known as 'ill thrift' occurs in unweaned and weaned lambs and the authors suggest that this might be related to subclinical muscular dystrophy. Sodium selenate was given s/c to half the lambs in each of five flocks at the rate of 1·0 mg. selenium every 7–10 days. Treatment commenced at 2–3 months of age and lasted from 62 to 105 days. The selenium treated lambs gained significantly more weight during the experimental period than the untreated lambs.—E. J. Castle.

Hartley, W. J., Mullins, J. & Lawson, B. M. (1959). **Nutritional siderosis in the bovine.** —N.Z. vet. J. **7,** 99-105. [Authors' summary modified.] **804**

An account of a hitherto unrecorded form of nutritional siderosis in cattle, characterized by intense siderosis of the liver and hepatic and pancreatic lymph nodes and by hepatic fibrosis. Comparison is made with similar pathological conditions in man, and the probable aetiology discussed.

Thacker, E. J. (1959). **Effect of a physiological cation-anion imbalance on the growth and mineral nutrition of rabbits.**—J. Nutr. **69,** 28-32. **805**

It has previously been reported that when calves were fed timothy hay grown on soil heavily fertilized with a mixture of nitrogen, phosphorus and potassium, they grew poorly, lacked appetite and developed anaemia and enlarged thyroid glands; cows lost condition after calving and had low milk yield [*J. Dairy Sci.* **41,** 182 (1958)]. In experiments with rabbits it was shown that the condition could be corrected by supplementing the diet with salts of Na, K, Ca or Mg carrying an anion metabolized to CO_2 and H_2O in the body, for example acetates and carbonates. Chlorides and sulphates were ineffective. Feeding this particular hay caused mineral imbalance which resulted in deficiencies of Ca and K despite the presence of adequate amounts of these elements in the diet.—R.M.

Kilgore, L., Almon, L. & Gieger, M. (1959). **The effects of dietary nitrate on rabbits and rats.**—J. Nutr. **69,** 39-44. **806**

The experiments described were part of a study on toxic hazards of nitrate fertilizers absorbed by fodder plants. Rabbits were fed 10–25 g. collards (a variety of kale) daily yielding an intake of between 0·12 and 0·2 g. $NaNO_3$ per animal and rats were fed 0·06–2·7 g. turnip greens yielding 0·007–0.3 g. $NaNO_3$. Other animals were fed known amounts of nitrate added to the diet. Conc. of methaemoglobin in the blood increased after ingestion of nitrate but in no case was abnormal behaviour observed. Not all the nitrate ingested was recovered in excreta; a small proportion was reduced to nitrite but the fate of some of the nitrate was unknown.

—R.M.

Irving, J. T. (1959). **Curative effect of selenium upon the incisor teeth of rats deficient in vitamin E.** — Nature, Lond. **184,** Suppl. No. 9 pp. 645-646. **807**

Rats deficient in vitamin E show degeneration of the enamel organ and whitening of the incisor teeth. Administration of alpha-tocopherol reverses these changes. Sodium selenite as 0·9 p.p.m. of Se in the diet also brought about recovery, but it was less uniform than with tocopherol.—M.G.G.

Metta, V. C., Mameesh, M. S. & Johnson, B. C. (1959). **Vitamin K deficiency in rats induced by the feeding of irradiated beef.**—J. Nutr. **69,** 18-22. [Authors' summary modified.] **808**

Consumption of diets containing beef irradiated with gamma-rays (2·79 or $5{\cdot}58 \times 10^6$ rad) resulted in internal haemorrhages and prolonged prothrombin times in growing male rats. Generally the female rat did not show this syndrome. The lesion was induced by freshly-irradiated beef as well as irradiated beef stored for over 6 months at room temperature. Supplements of vitamin K prevented the haemorrhagic diathesis.

Blackburn, P. S., Castle, M. E. & Drysdale, A. D. (1959). **Treatment of ketosis in dairy cows by potassium chlorate.**—Vet. Rec. **71,** 665-666. **809**

Nine cases of ketosis were treated with 1 oz. of potassium chlorate (BP) twice daily for three consecutive days. When treatment started all the cows gave positive reactions to Rothera's test, but 4 days later they were all negative. Blood samples taken before and after treatment gave mean values of 32·9 and 7·9 mg. acetone per ml. respectively. During and after treatment there was an immediate and very marked increase in milk yield.

—E. J. Castle.

Ruckebusch, Y. & Neveu, M. (1959). Acétose primitive de la vache laitière et insuline. **[Treatment of ketosis in dairy cows with insulin.]**—Rev. Méd. vét. **110,** July 522-528. [Summaries in English and Spanish.] **810**

In 150 cows symptoms of ketosis cleared up within 3–4 days after parenteral inj. of 120 i.u. of long-acting insulin. In 70, appetite returned to normal and nervous symptoms disappeared but the milk yield only returned to normal after a second inj. (90 i.u.). In 30, there was only an improvement in appetite; recovery soon followed when animals were put on pasture, or, if this was not possible, when the cows were given a second inj. and tied up in the open for some hours. The administration of 500 g. of sugar by the mouth is recommended in those cases (about 10%) in which the insulin causes excitement.—T.E.G.R.

See also absts. **928** (report, National Institute for Research in Dairying); **930** (report, Australia); **933** (book, soil, grass and cancer).

DISEASES, GENERAL

Anon. (1959). **Diseases of cattle.** — Bull. Minist. Agric. Lond. No. 169. pp. 72. London: H. M. Stat. Off. 4s. 6d. **811**

An authoritative account of the salient features of 36 of the most important infectious and non-infectious diseases. It is intended to help farmers recognize a disease at an early stage.—R.M.

Kraft, H. (1959). Erkrankungen beim Chinchilla. **[Diseases of chinchillas.]**—Kleintier-Praxis **4,** 56-60. [Summaries in English and French.] **812**

Disorders of the digestive tract are the most important diseases of chinchillas. Enteritis responds to sulphonamides, and obstipation to enemas of tepid water or liquid paraffin. Hard particles of food lodging between the teeth and at the base of the tongue cause necrosis in the mouth. Excessive growth of the teeth was seen in 3 generations on 2 chinchilla farms, and may have been hereditary. Skin mycosis due to *Trichophoron giganteum* is treated with 1% salicyl alcohol and an antimycotic dressing. The cause of shedding of the overhair is unknown, but affected animals often recover spontaneously.

—M.G.G.

Gürtler, H. & Richter, H. (1959). Zur Kenntnis der Transaminasen im Serum von Pferd, Rind und Schwein. **[Transaminase in serum of healthy horses, cattle and pigs.]** — Zbl. VetMed. **6,** 705-713. [Summaries in English, French, German and Spanish. English summary modified.] **813**

In relation to possible diagnostic applications, the activity of glutamic-oxaloacetic transaminase (SGO-T) and glutamic-pyruvic transaminase (SGP-T) in serum was determined by colorimetry. Horses had the highest activity of SGO-T, with cattle and pigs in descending order. The activity of SGP-T was lowest in horses. Haemolysis caused high serum values in the pig which can simulate increased activity. Serum was kept at 4°C. for up to two weeks without losing activity.

Compagnucci, M. (1959). Ricerche preliminari sulle attività trasaminasiche nei sieri di bovini sani e affetti da processi morbosi vari. **[Tramsaminase activity in the serum of normal and diseased cattle.]** — Boll. Soc. ital. Biol. sper. **35,** 762-763. **814**

Colorimetric measurements were made of transaminase activity in serum samples from 67 cattle of which 15 were normal, 10 were heavily, and 10 lightly infested with echinococcus, 10 were heavily and 10 lightly infested with fasciola, and 12 were affected with TB. (mainly pulmonary). There was an increase in transaminase in heavy echinococcus and fasciola infestation; in TB. and light echinococcus and fasciola infestations values were about normal.—T.E.G.R.

Steel, J. D., Whitten, J. H. & Hutchins, D. R. (1959). **Equine sensory ataxia ("wobbles"). Clinical and pathological observations in Australian cases.**—Aust. vet. J. **35,** 442-449. [Authors' summary modified.] **815**

Clinical observations of 15 and pathological findings in 11 cases of a disease very similar to that known in the U.S.A. as "wobbles" are described. Although the circumstances under which the disease occurs and the

clinical signs vary, two conditions, namely weakness and sensory ataxia, characterize the disease and provide the basis for diagnosis. It is suggested that the disease might be more precisely named "equine sensory ataxia". A speculative discussion of possible causes of the disease is presented.

Alexander, A. F. (1959). **Chronic alveolar emphysema in the horse.**—Amer. Rev. respir. Dis. **80,** No. 1. Pt. 2 pp. 141-142. Discussion: pp. 142-146. **816**

The clinical and pathological features are described. The aetiology is not known, but the association of the disease with dusty or mouldy fodder is mentioned. In the general discussion cardiac catheterization of a normal and a broken-winded horse was described and the ensuing observations were presented. Other points discussed were steroid therapy, the aetiology and the "irreversible" nature of the condition, emphysema in dogs, and brisket disease of cattle (for which the author prefers the name "high mountain disease of cattle").
—T.E.G.R.

Glazier, D. B. & Nicholson, J. A. (1959). **Premature ventricular beats.** — Irish vet. J. **13,** 82-86. **817**

Premature heart beats in horses can be caused by drugs, such as chloral hydrate and adrenaline, and may also occur during infectious diseases, especially those of the upper respiratory tract. Premature ventricular beats are characterized by an abnormal QRST complex, a prolonged QRS interval and a compensatory pause. They were detected in 4 of 270 horses and considered due to cardiac abnormality. Three lacked stamina. The fourth had suffered severe burns in a fire; its electrocardiogram is presented. Drugs suggested for treatment are quinidine with barbiturate; digitalis; and intravenous magnesium sulphate.—M.G.G.

I. Pritchard, W. R. & Wassenaar, P. W. (1959). **Studies on the syndrome called mycotic stomatitis of cattle.**—J. Amer. vet. med. Ass. **135,** 274-277. [Authors' summary modified.] **818**

II. Pritchard, W. R. & Ristic, M. (1959). **Studies on the syndrome called mycotic stomatitis of cattle.**—Proc. XVIth Int. vet. Congr., Madrid **2,** 139-140. **819**

I & II. The cause of "mycotic" stomatitis of cattle in America (also known as ulcerative or aphthous stomatitis, and thrush) is still unknown. Attempts to transmit the condition by various routes to calves and other animals all failed. Serum from affected cattle did not contain antibodies against the virus of vesicular stomatitis.—R.M.

Blaser, E. (1959). Weitere Erfahrungen mit der medikamentellen Fremdkörper-Behandlung. **[Treatment of foreign body gastritis in cattle by intraperitoneal injection of antibiotics.]** — Schweiz. Arch. Tierheilk. **101,** 161-175. [Summaries in English, French and Italian.] **820**

In 7 years over 1,000 cattle with foreign body gastritis were treated by i/p injection of antibiotics, with recovery in 96·5%. The recommended dose was 3–5 million i.u. penicillin and 5 g. streptomycin in olive oil. Severe cases received 2 injections. Relapses were observed in 10%, mostly within 4 weeks. A questionnaire answered by 30 veterinary surgeons showed that 7 preferred surgical intervention, 9 i/p injection of antibiotics, 10 either surgical or i/p treatment, 3 the magnetic probe together with i/p injection, and one the magnetic probe alone. Recovery was reported in 90% of cases treated by the i/p method.
—M.G.G.

Guarda, F. (1958). Sull'ossificazione metaplastica eterotopica a sede cardiaca e renale nei bovini. **[Metaplastic ossification in the heart and kidney in cattle.]**—Ann. Fac. Med. vet. Torino **8,** 253-264. [Summaries in English, French and German.] **821**

In an otherwise healthy slaughter cow there was enlargement of the heart with marked hypertrophy of the left ventricle and pale myocardium due to degenerative changes. A more or less compact plaque, 10 × 6 cm., consisting of cartilaginous and osseous tissue occupied the wall of the right auricle. Isolated nodules of the same consistency and varying in size from that of a pea to that of a walnut were found in the walls of the ventricles. In a second animal with severe pyelonephritis of the left kidney the renal pelvis was occupied by spongy bone tissue, about 11 × 8 cm.
—T.E.G.R.

Schalk, C. & Hoekstra, P. (1959). Oriënterend onderzoek naar het voorkomen van steilheid in de spronggewrichten bij Nederlandse runderen. **[Preliminary investigation of "straight hocks" in Dutch cattle.]**—Tijdschr. Diergeneesk. **84,** 927-934. [In Dutch. Summaries in English, French and German.] **822**

As a result of remarks that the conformation of the hind legs was becoming too straight,

leading to faulty gait, increased incidence of fractures, and was possibly related to spastic paresis, the authors measured the angle formed by the posterior border of the metatarsus and Achilles tendon in 86 Friesian bulls, 162 Friesian cows, 50 Meuse-Rhine-Yssel (MRY) bulls and 94 MRY cows. The angle was greater in cows than in bulls, and greater in MRY cattle than in Friesians. The angle also increased with increasing age up to 2–3 years. [The authors did not discuss the relevance of these findings to spastic paresis.]—R.M.

Alexander, G., Peterson, J. E. & Watson, R. H. (1959). **Neonatal mortality in lambs: intensive observations during lambing in a Corriedale flock with a history of high lamb mortality.** — Aust. vet. J. **35,** 433-441. [Authors' summary modified.] **823**

Intensive observations were made at lambing on 62 single and twin lambs and their mothers in a flock which had experienced high neonatal mortality for some years. Of 25 lambs which died in the first three days 22 had failed to obtain milk, probably because of the cold, wet and windy weather. The weather was that normally experienced by the flock at lambing. Deficient maternal factors and lamb vigour were also implicated, each in the death of eight lambs. Infection was not responsible for any of the deaths.

Of 62 single and twin lambs removed from the ewes at birth and provided with food and warmth only one died within 3 days of birth.

Clegg, F. G. (1959). **A convulsive syndrome in sheep.**—Vet. Rec. **71,** 824-827. [Author's summary modified.] **824**

A convulsive syndrome caused severe losses in a self-contained sheep flock in autumn 1957, and a similar condition affected lambs on the same pasture in the following autumn. The history of the outbreak, the alarming clinical signs, and the histopathology are described. The condition was similar to the recorded descriptions of convulsive ergotism in ruminants in other parts of the world. C. suggested a possible relationship with vitamin A deficiency.

Anon. (1959). **A survey of the incidence and causes of mortality in pigs. I. Sow survey.**—Vet. Rec. **71,** 777-786. [Summary modified.] **825**

A survey carried out by the Veterinary Investigation Service in England and Wales during a 2-year period (1956–58) showed an average death-rate up to 8 weeks of age in 2,581 litters of 25·9%. 80% of the losses occurred during the first week of life. Deaths in pigs over 2 months old were estimated to be less than 2%. Examination of a representative sample of the pigs that died showed that the main causes of death varied in different age groups. The results of P.M. and laboratory findings are tabulated and attention is drawn to those problems which warrant further study.

Swahn, O. (1959). **Organisation and activities of the swine health control in Sweden.**—Tijdschr. Diergeneesk. **84,** 659-665. [In English. Summary in Dutch.] **826**

A system for the control of pig health is administered by the County agricultural societies with the support of the Swedish farmers' associations, the Royal Veterinary Board, and the meat marketing organization. Pig farmers who wish to join the scheme contract for at least two years to follow the regulations and to act upon veterinary advice. Pigs from farms granted a health certificate are specially identified by ear tattoo or ear tag. The farmer receives a bonus for these pigs from the meat marketing association.—R.M.

O'Donoghue, J. G., Whenham, G. R. & Graesser, F. E. (1959). **A Glasser's-like syndrome in Alberta swine.** — Canad. J. comp. Med. **23,** 146-152. [Summary in French.] **827**

A serositis and arthritis syndrome resembling that described by Glässer existed in Alberta. No specific aetiological agent was demonstrated by routine bacteriological studies. Clinical evidence suggested an infectious disease and this theory was enhanced by the therapeutic effects of tetracycline and oxytetracycline. It was suggested that a carrier or a subclinical infectious state might be responsible for the spread.—R. V. L. Walker.

Schofield, F. W. & Un Ik Chung. (1959). **The introduction and spread of atrophic rhinitis of swine in Korea.**—J. Amer. vet. med. Ass. **135,** 375-376. [Authors' summary modified.] **828**

Atrophic rhinitis has been diagnosed in pigs in Korea; it appears to have been imported by pigs from the U.S.A. To prevent the entry of disease, the use of frozen semen or pigs isolated from birth by caesarian section must be considered.

Lukashev, I. I., Petrenko, G. G. & Andriyan, E. A. (1959). **[Methods for prophylaxis of porcine atrophic rhinitis, especially treatment with streptomycin or sulphathiazole.]** —

Veterinariya, Moscow **36**, No. 11 pp. 16-18. [In Russian.] **829**

Among other measures the authors recommended prophylactic treatment of all new-born piglets on infected farms with streptomycin (10,000 units in 1 ml.) applied intranasally or norsulfazole sodium (sulphathiazole sodium) injected i/m, 2 ml. of 20% soln./kg. body wt. Pregnant sows should be given supplementary vitamins A and D if necessary.—R.M.

Ryu, E., Pan, I. C. & Yeh, Y. C. (1959). **Study of edema disease of swine.** — Mem. Coll. Agric., Nat. Taiwan Univ. **5**, 39-51. [In English.] **830**

The disease, first diagnosed as swine fever, has existed for several years in Formosa. In pigs treated with lapinized swine fever vaccine it was responsible for 90% of deaths then ascribed to vaccine reaction. Clin. symptoms and P.M. findings in these and in 11 naturally infected pigs (of which 2 had recovered) were suggestive of oedema disease. Gross and histological lesions are described. No bacterial agent was isolated and transmission experiments on a rabbit and 2 pigs were inconclusive.—T.E.G.R.

Griem, W. (1959). Schilddrüsenveränderungen bei der Leberdystrophie des Schweines. **[Thyroid lesions in liver dystrophy in pigs.]** —Dtsch. tierärztl. Wschr. **66**, 299-301. [Summary in English.] **831**

G. examined histologically the thyroid glands from 33 pigs which died from toxic liver dystrophy. Some glands were normal. Others showed signs of activation or hyperaemia. Activation was associated with regressive transformation of the adrenal cortex.

—R.M.

Quinchon, C. & Carles, R. (1959). L'épreuve de Thorn chez le porc. **[The eosinophile reaction of Thorn as a test of adrenal cortical function in pigs.]** — C.R. Soc. Biol., Paris **153**, 231-233. **832**

Five pigs were inoculated with 5 i.u. or more of ACTH. Within 2–4 hours the number of circulating eosinophiles decreased by about 95%, and remained low for several hours. The test is proposed for studying the function of the adrenal glands in pigs.—M.G.G.

Archer, R. K. & Bowden, R. K. (1959). **A case of true haemophilia in a Labrador dog.** —Vet. Rec. **71**, 560-561. **833**

True haemophilia A was demonstrated in a dog aged 5 months by the thromboplastin generation test described by Biggs & Douglas (1953). The condition was corrected by addition of horse antihaemophilic globulin.

—T.E.G.R.

Klapproth, H. J., Takagi, H. & Corcoran, A. C. (1959). **Early effects of X-irradiation on specific renal functions in dogs.** — Lancet August 22, 161-162. **834**

Irradiation causes renal failure and hypertension, the clinical manifestation of which is delayed so that "acute radiation nephritis" is considered as occurring 6–12 months after radiotherapy. The early structural and functional effects, as observed after X-irradiation of subcutaneously explanted kidneys of three uninephrectomized dogs, are described and discussed.—T.E.G.R.

Holmes, J. R. (1959). **Further studies on the experimental transmission of avian osteopetrosis.** — J. comp. Path. **69**, 385-389. [Author's conclusions.] **835**

The agent which produced avian osteopetrosis when inoculated intraperitoneally into day-old chicks [*V.B.* **29**, 744] passed through a Seitz EK filter. The disease also occurred following oral administration of unfiltered plasma. A small percentage of the progeny of affected parents also developed the condition. Cortisone acetate given intramuscularly every day for the first 23 days of life following inoculation with whole blood at one day old appeared to have no influence on the incidence of the disease.

Henstell, H. H. & Kligerman, M. (1959). **Hyperglobulinaemic thrombo-haemorrhagic diathesis.**—Nature, Lond. **183**, 978-979. **836**

Haemorrhagic diathesis occurred in various human diseases associated with excessive amounts of globulins in the blood plasma, such as visceral leishmaniasis. This was probably due to combination of globulins with clotting factors, a theory supported by successful treatment of a case of cryoglobulinaemia with dicoumarol.—R.M.

Barreira, F. & Mendes, J. A. (1959). **Cattle and sheep thyroid activity showing an abnormal decay.** — Rev. Cienc. vet., Lisboa **54**, No. 368 pp. 15-20. [In English. Summary in Portuguese.] **837**

The half-life of radioactivity in the thyroid gland of sheep and cattle was about 11 days, whereas the half-life of radio-iodine is 8 days. Attempts will be made to identify the isotopes.—M.G.G.

Anon. (1959). **Maximum permissible dietary contamination after the accidental release of radioactive material from a nuclear reactor. Report to the Medical Research Council by its committee on protection against ionizing radiations.**—Brit. med. J. April 11th, 967-969. **838**

Figures are given for the maximum permissible daily intake by human beings of radioactive iodine, strontium and caesium. Figures for iodine-131 were based on the assumption that the highest conc. in milk would be 0·065 μc. per litre.—R.M.

Anon. (1959). **Strontium 90 in human diet in the United Kingdom 1958.** Agricultural Research Council Radiobiological Laboratory Report No. 1 pp. 75. London: H.M. Stat. Off. 4s. **839**

The A.R.C. is responsible for surveying the strontium-90 content of human diet in the U.K., and for provision of information on factors which affect the rate at which strontium-90 enters food chains. This first report deals with the situation in 1958.

The report is much more than an enumeration of the analytical results on a variety of foods. The data, evidence, arguments and conclusions are presented in a readable and convincing manner. The result is a comprehensive picture of the journeyings of strontium-90 from raindrops to our dinner plates.

The mean ratio of strontium-90 to calcium in the average U.K. diet for 1958 is given as about 6 $\mu\mu$c. per g.; values above 10 are not thought to be likely in any large area, and 23 is given as an upper limit in the "special areas".—M. K. Lloyd.

POISONS AND POISONING

Pryor, W. J. (1959). **An outbreak of copper poisoning in sheep following copper top-dressing of pastures.**—Aust. vet. J. **35**, 366-369. [Author's summary modified.] **840**

In an outbreak of chronic copper poisoning of sheep the evidence suggested that pasture containing high amounts of copper was the cause. The high levels followed top-dressing with copperised superphosphate. It is suggested that kikuyu grass may have special ability to take up copper.

Brink, M. F., Becker, D. E., Terrill, S. W. & Jensen, A. H. (1959). **Zinc toxicity in the weanling pig.**—J. Anim. Sci. **18**, 836-842. **841**

In experiments involving 92 newly-weaned piglets zinc carbonate was added to the diet in proportions of 0·05–0·8% for 35 days. The animals tolerated a conc. of 0·1% Zn but higher concentrations caused loss of weight, arthritis, haemorrhages with formation of large haematomas in the axillary space, and gastro-enteritis. Addition of 1% dicalcium phosphate to the diet had no influence on the toxicity of zinc.—R.M.

Bentz, H. & Bresan, P. (1959). Zur Natriumsalzvergiftung des Schweines. **[Salt poisoning in pigs.]**—Arch. exp. VetMed. **13**, 57-60. **842**

The sodium content of normal pig tissues was determined by extraction and flame photometry and also by ashing. The two methods gave similar results and were suitable for determining sodium chloride poisoning in pigs. Some of the mean normal values were: stomach 122 mg. %; liver 97; intestine 109; heart 100; lungs 183; muscle 52 mg. %.

—M.G.G.

Rac, R., Bray, J. H. & Lynch, J. (1959). **Meningo-encephalitis eosinophilica of pigs.**—Vet. Rec. **71**, 688-692. [Authors' summary modified.] **843**

Two outbreaks of salt poisoning in pigs resulting from the feeding of contaminated whey are described. The clinical, post-mortem, bacteriological, histopathological, and biochemical features are presented including the histopathology of a recovered pig. Salt contamination of whey intended for feeding is likely to arise where there is good recoverable value in the butterfat in vat and press drainings. It is considered impracticable to make available additional drinking water where pigs are being encouraged to drink maximum amounts of whey.

Anon. (1959). **Fluoride tests terminated.**—Fm Home Sci., Utah **20**, 79. **844**

32 heifers were divided into 4 groups, and given 0, 25, 50 or 100 p.p.m. of fluorine in the ration for 8 years. 25 other cattle received various industrial fluorides. Detailed biopsy and P.M. findings will be published elsewhere. After 4 years no significant effect was seen on food consumption, weight gain, height at withers, reproduction, and milk and butter-fat production in the first lactation. Dental fluorosis occurred in all the animals receiving fluorine, and exostoses and intermittent

lameness were seen in the group fed 100 p.p.m. Animals fed sodium fluoride retained 3 times as much fluorine in their bones as those fed calcium fluoride and 7–8 times as much as controls.—M.G.G.

Likins, R. C., Scow, R. O., Zipkin, I. & Steere, A. C. (1959). **Deposition and retention of fluoride and radiocalcium in the growing rat.** —Amer. J. Physiol. **197**, 75-80. 845

Radiocalcium was used to study the effect of daily oral administration of 0·33 mg. NaF for a month on Ca metabolism in various parts of the tibia, in whole bones, and in the dentin and enamel of molar and incisor teeth.—R.M.

Schipper, I. A. & Anders, R. (1959). **Toxicology of wood preservatives to swine.**— Bi-m. Bull. N. Dak. Fm Res. **21**, 8-11. 846

Sows due to farrow in a few days were placed in crates with wooden floors freshly treated with preservatives containing pentachlorophenol or creosote. Many stillbirths occurred. The piglets were unthrifty and many died. Burns and necrosis of the udder of the sows and of the face of the piglets were seen. No toxicity was seen when straw bedding was provided.—M.G.G.

Hilf, R., Castano, F. F. & Lightbourn, G. A. (1959). **Identification of alkaloids and related compounds by paper chromatography and ultraviolet spectrophotometry.**—J. Lab. clin. Med. **54**, 634-639. [Authors' summary modified.] 847

A procedure for extracting and identifying several alkaloids (including morphine, codeine, strychnine; atropine, promazine hydrochloride) and antihistamines is presented. Paper chromatography at 4 different pH values separated most of the related drugs of forensic interest. Elution from the paper followed by ultraviolet absorption spectrophotometry was a further method of identification.

Owens, E. L. (1959). **Observations on the toxicity of brewers' grain for dairy cows.**— N.Z. vet. J. **7**, 43-46. [Author's summary modified.] 848

In outbreaks of lactic acid poisoning in cows a high rumen content of lactic acid was associated with the feeding of brewers' grains stored in heaps which quickly soured.

The main clinical signs were ataxia, dehydration, glazed eyes, and dark tarry faeces. Temperatures were normal or subnormal. A few cows died.

Treatment with sodium bicarbonate and intravenous glucose proved effective.

Braid, K. W. (1959). **Bracken: A review of the literature.** pp. 69. Farnham Royal: Commonwealth Agricultural Bureaux. [Mimeographed publication No. 3/1959. Commonwealth Bureau of Pastures and Field Crops.] 849

Six pages of this review are devoted to bracken poisoning and the rest deals with ecology, chemical composition, and control. [462 references.]—R.M.

Compère, R. (1959). Etude toxicologique de Leucaena glauca chez les bovins. [**Toxicity of Leucaena glauca for cattle.**]—Bull. agric. Congo belge **8**, 1311-1320. [In French. Summary in Flemish.] 850

A bull was fed solely on *L. glauca* for 75 days when the experiment was terminated owing to the bad state of the animal. Symptoms of toxicity were: tendency to constipation, alopecia of certain parts of the body, salivation, progressive inappetence, laboured respiration, accelerated pulse, subnormal temperature, depression, lacrimation, swelling of the cheeks and slight loosening of the hooves.—T.E.G.R.

Schmittle, S. C., Richey, D. J. & Tumlin, J. T. (1959). **Toxicity of Crotalaria spectabilis seed in poultry.** — Poult. Sci. **38**, 1244-1245. 851

Ten chicks fed *C. spectabilis* seed as 1% of the ration died in 4 weeks. In ten given the seed as 0·1% of the diet growth was poor and 2 died. Lesions were moderate to severe ascites, hydropericardium, and yellow discoloration, haemorrhage and atrophy of the liver.—M.G.G.

Shenstone, F. S. & Vickery, J. R. (1959). **Substances in plants of the order Malvale causing pink whites in stored eggs.**—Poult. Sci. **38**, 1055-1070. 852

Pullets fed 25 mg. daily of malvalic acid or sterculic acid laid eggs which developed pink whites after storage for 1–2 weeks. The discoloration was caused by combination of conalbumen in the white with iron diffusing from the yolk. Three birds fed 250 mg. of sterculic acid ceased to lay. Other effects were a red, glutinous yolk and convergence of the pH of the yolk and white. About 20–25% of the ingested acid was incorporated in the yolk. These two fatty acids are positive to the Halphen colour test. Other fatty acids extracted from *Malva* spp. were negative to the test and did not cause pink whites.—M.G.G.

I. Kronfeld, D. S. (1959). **In vivo studies on the toxicity of an aminoquinoline piroplasmocide.**—Aust. vet. J. 35, 415-416. 853

II. Kronfeld, D. S. (1959). **In vitro studies on the toxicity of an aminoquinoline piroplasmocide.** — Ibid. 417-419. [Author's summaries modified.] 854

I. Anaesthetized cats and unanaesthetized rats were poisoned with Acaprin (quinuronium sulphate). Anoxic excitation culminated in respiratory arrest. Death appeared to be due to histotoxic anoxia. Attempts to protect rats with adrenaline, ephedrine, and dexamphetamine failed.

II. Quinuronium sulphate depressed the oxygen consumption of rat liver slices and the cytochrome oxidase activity of g.pig brain and muscle homogenates. These observations supported the theory that death of poisoned animals was due to histotoxic anoxia. Its toxic effect when given at the full dose in early piroplasmosis may be due to sufficient of it remaining free because there are too few parasites to fix it.

Holmstedt, B. (1959). **Pharmacology of organophosphorus cholinesterase inhibitors.** —Pharmacol. Rev. 2, 567-688. 855

This review will interest those concerned with toxicity of organic phosphorus parasiticides. There are 764 references.—R.M.

See also absts. 928 (report, National Institute for Research in Dairying); 929-930 (reports, Australia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

English, P. B. & Withy, D. (1959). **Serum, urine, and tissue levels of chloramphenicol in the horse.**—Aust. vet. J. 35, 187-193. Discussion: pp. 336-337. 856

Exceedingly small serum concentrations, persisting for 4–5 hours, were obtained after i/m injection of chloramphenicol (20 and 30 mg./kg. body wt.). Urine concentrations were much higher and persisted for 24–30 hours. Tissue concentrations were ascertained in 3 horses which had received 20 mg./kg. body wt. intramuscularly 5 or 6 hours before destruction. Muscle, liver, and kidney showed reasonably high levels, while spleen and lung were negative.

The authors suggest that chloramphenicol may diffuse from the blood into the tissues, whence it is released back into the bloodstream in low, undetectable amounts.

—G. A. Stewart.

English, P. B. (1959). **Serum penicillin concentrations in the bovine with fortified benzathine.**—Aust. vet. J. 35, 353-358. [Author's summary modified.] 857

Serum penicillin concentrations were studied in 8 steers during 120 hours after i/m injection of fortified benzathine penicillin G in doses of (a) 12,500, (b) 25,000 and (c) 50,000 units/kg., respectively.

At half an hour and 120 hours serum penicillin concentrations (μg./ml.) were (a) 2 and 0·017; (b) 6·4 and 0·028; (c) 8·8 and 0·56 respectively. A single dose of 25,000 units/kg. fortified benzathine should produce a therapeutic effect for 5 days and a single dose of 12,500 units/kg. should be sufficient for prophylactic purposes.

Babad, J., Boros, D. L. & Baier, F. (1959). **Lowered bactericidal efficiency of hydrogen peroxide on milk from cows treated with penicillin.**—Nature, Lond. 184, Suppl. No. 5 pp. 292-293. 858

Interference with the bactericidal efficiency of hydrogen peroxide as a raw milk preservative was observed with samples of milk from cows treated with penicillin. When penicillin was added experimentally to raw milk samples, in some the interference was directly proportional to the concentration of penicillin, while in others there was minimal interference irrespective of the concentration. It appears that the phenomenon of interference may depend on the quality of the milk microflora. Thermoduric organisms may be responsible.—A. Ackroyd.

Carminati, G. M. (1959). Tossicità particolare della penicillina e della streptomicina per via endocerebrale. **[Toxicity of penicillin and streptomycin injected intracerebrally.]**—Boll. Soc. ital. Biol. sper. 35, 423-425. 859

In the course of intracerebral passage of suspensions of organs of mice which died after inoculation with distemper virus it was repeatedly observed that the animals showed signs of toxicity affecting the c.n.s. soon after inoculation. Investigation revealed that penicillin and streptomycin, used to prevent bacterial contamination, were responsible for the toxicity. A study of the phenomenon was

undertaken with a view to establishing the non-toxic dose of the antibiotics by the cerebral route.—T.E.G.R.

Bevelander, G., Nakahara, H. & Rolle, G. K. (1959). **Inhibition of skeletal formation in the chick embryo following administration of tetracycline.**—Nature, Lond. **184,** Suppl. No. 10 pp. 728-729. **860**

Tetracycline (0·1–2·5 mg.) was injected into the yolk sac of chick embryos 8 days old. 24 hours later it appeared exclusively in the calcified portions of the skeleton. Microscopic examination of femurs 2–8 days after injection showed bending, reduced mineralization and number of trabeculae, thickening of the periosteum, arrested development of haemopoietic elements, and slow chondrogenesis. Overall growth was greatly retarded in embryos given 2·5 mg.—M.G.G.

Aronson, A. L. (1959). **Pharmacological studies on the addicting analgesics and their antagonistics in the dog.**—Thesis, Cornell pp. 91. **861**

In this detailed study of the action of levorphanol and nalorphine the author attempts to determine the best method of using them as adjuncts to general anaesthesia as well as the site and mechanism of their action.

Levorphanol and nalorphine alleviate the respiratory depression induced by morphine and Demerol (pethidine) and are practical adjuncts to general anaesthesia in the dog. They confer little if any protection against the hypotensive effects of morphine and pethidine. The proper functioning of cholinergic mechanisms is necessary for normal respiration. Experimental evidence indicates that morphine exerts its depressant effect on respiration by inhibiting some other energy-producing enzyme system in the central nervous system.—Herbert L. Gilman.

Bentele, W. (1959). Über die Verwendung von Combelen zur Beruhigung bösartiger Bullen. [**"Combelen" as a tranquillizer for vicious bulls.**] — Vet.-med. Nachr. No. 1 pp. 33-35. **862**

"Combelen" is N (3 - dimethylamino - propyl)-3-propionyl phenothiazine phosphate. It was a good tranquillizer for vicious and intractable bulls. Since the drug produced atony of pharyngeal and laryngeal muscles, it was necessary to withhold water and food for 6–8 hours after i/m injection.—F. R. Paulsen.

Neal, P. A. & Wright, J. G. (1959). **The use of succinylcholine chloride as a casting agent in the horse prior to the induction of general anaesthesia.** — Vet. Rec. **71,** 731-735. [Authors' summary modified.] **863**

The use of succinylcholine chloride by i/v injection when casting 20 horses before the induction of general anaesthesia is described. When dealing with tame, quiet horses the authors preferred to use the hobble method, but with unbroken or vicious animals they believed that the use of succinylcholine was not only safer and more certain, but no more distressing.

Attention was drawn to the marked irregularities of the action of the heart which the drug causes, a feature not recorded by other workers.

Duchateau, J. (1959). Contribution à l'étude de l'emploi en anesthésie chirurgicale chez le chien d'un nouveau curarisant de synthèse. "L'ucépha 5076 ou médiatonal". [**Curariform action of "Mediatonal" on dogs and its use in surgical anaesthesia.**] — Thesis, Paris (Alfort) pp. 44. **864**

This quaternary ammonium derivative is the di-iodide of 12 bis (p-trimethyl ammonium ethoxyphenol) 3-methyl butane. For general anaesthesia, a dose of 0·3 mg./kg. body wt. [? intravenously] was satisfactory when followed after 2–5 min. by intravenous thialbarbitone. Combined anaesthesia was used on 30 dogs.—R.M.

Kirillov, M. N. (1959). [**Intravenous retrograde anaesthesia with procaine.**] — Veterinariya, Moscow **36,** No. 10 pp. 36-37. [In Russian.] **865**

A limb may be anaesthetized by injecting procaine soln. into a subcutaneous vein at a point below a tourniquet placed around the limb. This method has been described in Russian medical literature [Y.B. Ryvlin (1952) *Vestnik Khirurgii* No. 5]. In horses, cattle and sheep K. used 10–20 ml. 10% procaine soln. plus 400,000 units penicillin. Anaesthesia persisted until the tourniquet was removed, the maximum being 2 hours. This method could be used for surgical operations and to combat post-operative infection; also to treat arthritis. A fuller account of this work was published in *Trud. Omsk vet. Inst.* **15,** 161–165 (1957).

—R.M.

See also absts. **611** (neomycin in mastitis); **613** (antibiotic and prednisolone in mastitis); **614** (prednisone in mastitis); **635** (failure of furazolidone in pullorum disease); **665** (infectious synovitis); **735** (streptomycin in psittacosis of pigeons); **745-746** (insecticides); **748, 751, 757-761, 763, 765, 766** (anthelmintics); **782** (canine leucosis); **796** (antibiotics in poultry nutrition); **810** (insulin in bovine ketosis); **820** (antibiotics in foreign body syndrome); **829** (porcine atrophic rhinitis); **934** (book, veterinary surgery).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

I. Dowling, D. F. (1959). **The medullation characteristic of the hair coat as a factor in heat tolerance of cattle.**—Aust. J. agric. Res. **10,** 736-743. **866**

II. Dowling, D. F. (1959). **The significance of the coat in heat tolerance of cattle.**—Ibid. 744-748. [Author's summaries modified.] **867**

I. Measurements of the hair fibres of cattle show seasonal variation in the length, diameter, and weight of hair per unit area and marked changes in the incidence and degree of medullation.

The medulla, a structural component of the hair fibre, may be a critical characteristic of the coat in the regulation of heat dissipation. The correlation between the incidence of medullation and the animal's ability to regulate the rectal temperature was 0·95.

II. The heat tolerance of two strains of cattle, one with strongly medullated hair, was measured with and without previous clipping and with and without a plastic coat. The results suggest that seasonal differences in heat tolerance can be attributed to changes in the coat. Animals with long, woolly winter coats were not heat-tolerant until they were clipped. Animals with medullated coats were relatively heat-tolerant, either clipped or unclipped. Clipping improved their temperature control but not as much as in animals with a non-medullated coat.

Weeth, H. J., Torell, C. R. & Cassard, D. W. (1959). **Effects of a simulated snowbound stress condition on ewes.**—J. Anim. Sci. **18,** 694-700. **868**

The authors investigated deaths in snowbound sheep or cattle after eating lucerne hay. 72 ewes, some pregnant, were penned out in the snow with snow as the only source of drinking water. During starvation for 6 days blood ketones increased and the proportion of eosinophiles in blood decreased; symptoms of ketosis developed. Most sheep recovered promptly after being given lucerne hay or grass hay plus barley or cotton-seed meal, but nine ewes would not eat when food was provided, apparently because of impaired vision which may have been caused by ketosis; these sheep recovered after being forcibly fed with soluble carbohydrate.—R.M.

Kaemmerer, K. & Schneidrzik, W. E. J. (1959). Studien zu Problemen des natürlichen Winterschlafes. **[Studies on natural hibernation.]** —Arch. exp. VetMed. **13,** 65-90. **869**

Brown fat, plasma and extracts of brown fat and the whole body were obtained from hibernating bats. Inoculation of mice, a dog and a pig caused a decrease in activity and a fall in body temp. of about 2°C. The effects lasted for 2–48 hours, depending on the dose and depth of hibernation of the donor. The literature on the physiology of hibernation was reviewed.—M.G.G.

Lloyd, D. P. C. (1959). **Response of cholinergically innervated sweat glands to adrenaline and noradrenaline.** — Nature, Lond. **184,** Suppl. No. 5. pp. 277-278. **870**

Impedance changes indicating response of the sweat glands were observed across the foot pad of cats following intravenous injection of noradrenaline as well as when the centrally severed plantar nerves were electrically stimulated. Atropine did not block the response produced by noradrenaline. It is probable that all sweat glands are cholinergically innervated, but, in addition, their secreting cells are responsive to adrenaline and noradrenaline.

—A. Ackroyd.

Joubert, D. M. & van Marle, J. (1959). **Birth weights and related phenomena in cattle.**— S. Afr. J. agric. Sci. **2,** 133-135. **871**

The mean weight of 29 cows of different breeds was 1,026·8 lb. pre-partum and 879·4 lb. post-partum. The mean weight of the calf at birth was 72·2 lb., of the foetal membranes 11·2 lb. and of the foetal fluids 5·4 lb. Failure to account for 58·6 lb. was probably due to increased catabolic activity at calving and inaccurate measurement of the foetal fluids. There was a positive correlation between foetal weight and placental weight. It is considered that the foetus has priority over accessory tissues in poorly fed cows, and that a decrease in the size of the placenta and the volume of foetal fluid may complicate parturition.

—M.G.G.

Perek, M. & Eckstein, B. (1959). **The adrenal ascorbic acid content of molting hens and the effect of ACTH on the adrenal ascorbic acid content of laying hens.**—Poult. Sci. **38,** 996-999. [Authors' summary modified.] **872**

Adrenal ascorbic acid determinations in moulting hens, in ACTH-treated laying hens, and in pullets aged 3 months revealed that depletion of the adrenal ascorbic acid can be elicited in laying hens by ACTH injections as readily and to the same extent as in mammals. No response to ACTH injections was noted in

pullets. Depletion of adrenal ascorbic acid was similar in untreated moulting hens and in ACTH-treated laying hens.

These results suggest that moulting in hens is triggered by stress and mediated by the pituitary and adrenal glands.

Matscher, R. & Beghelli, V. (1959). Azione di alcuni 19-nor-steroidi sulla ovulazione della gallina. **[Effect of 19-nor-steroids on ovulation in fowls.]**—Boll. Soc. ital. Biol. Sper. **35**, 22-24. **873**

Hens were treated with: (a) 17-α-ethynil-19-nor-testosterone; (b) 17-α-ethynil-oestrenolone; (c) 17-α-methyl-19-nor-testosterone. Dosage was 2 mg. of steroid on 3 alternate days. Egg production ceased 1 day, 1–2 days and 1–3 days, respectively, after the beginning of treatment. In groups (a) and (c) egg production was in abeyance for 12 days and in (b) for 40 days. After 3 months there was no increase in egg production nor was there any sign of moulting.—T.E.G.R.

Brumby, P. J. (1959). **The influence of growth hormone on growth in young cattle.**—N.Z. J. agric. Res. **2**, 683-689. [Author's summary modified.] **874**

Twelve pairs of identical-twin heifer calves were divided into 3 groups, and daily injections given, respectively, for 12 weeks as follows: growth hormone (5 mg./100 lb. body wt.); l-thyroxine (0·5 mg./100 lb.); normal saline (1 ml.). During this period live wt. gain in the growth-hormone group was approx. 14 lb. more than in controls, whereas in the thyroxine group it was some 12 lb. less than in controls. Extra gains in height over the controls were 20 mm. (growth hormone group) and 14 mm. (thyroxine group). L-thyroxine increased blood sugar by some 20–30%. An increase in blood sugar recorded in the growth-hormone group was slightly less than this and was probably due to contamination of the hormone with thyrotrophic hormone. Non-protein nitrogen levels in the blood were unaffected by either growth hormone or thyroxine.

Metcalf, J., Romney, S. L., Swartwout, J. R., Pitcairn, D. M., Lethin, A. N. & Barron, D. H. (1959). **Uterine blood flow and oxygen consumption in pregnant sheep and goats.**—Amer. J. Physiol. **197**, 929-934. **875**

In the non-pregnant uterus the blood flow was about 25 ml./min. It increased to 200 ml./min. at 80 days of pregnancy and 1,000 ml./min. near full term (150 days). Oxygen consumed by the uterus averaged 8·9 ml. per kg. of foetal weight per min., which was not very different from values obtained in rabbits and women.—R.M.

Coxon, R. V. & Robinson, R. J. (1959). **Movement of radioactive carbon dioxide within the animal body during oxidation of ^{14}C-labelled substances.** — J. Physiol. **147**, 487-510. [Authors' summary modified.] **876**

Measurements of the specific activity of carbon dioxide in arterial blood and in the venous blood from a number of organs were made after the injection of labelled glucose, acetate and palmitate into dogs and monkeys. During the hour following the injection, organs either increased or reduced the specific activity of carbon dioxide in blood passing through them. Brain, liver and kidney increased specific activity, resting muscles reduced it.

An empirical explanation is offered of time changes in specific activity of expired CO_2 during oxidation of glucose. The application of these findings to model systems used in the interpretation of data from animal experiments employing isotopic tracers is discussed.

Houpt, T. R. (1959). **Utilization of blood urea in ruminants.**—Amer. J. Physiol. **197**, 115-120. **877**

Urea was injected i/v into mature sheep given a ration low in protein, supplemented with carbohydrate. About half of the urea was not accounted for by excretion in urine or persistence in blood and this was presumably utilized in protein synthesis in the rumen. In further experiments the reticulum and rumen were isolated from the rest of the digestive tract and their contents were replaced by saline. Accumulation of ammonia derived from i/v injected urea in the saline and excretion of urea in saliva were measured.—R.M.

Lengemann, F. W. (1959). **The metabolism of magnesium and calcium in the rat.**—Arch. Biochem. **84**, 278-285. **878**

Chlorides of Mg-28 or Ca-45 were given in single doses by mouth or intraperitoneally. Mg was more readily absorbed than Ca and greater amounts of Mg were excreted in urine and faeces. Radioactivity appeared earlier after administration of Mg than after Ca, but more Ca accumulated in bone. The effect of varying doses of one element on uptake of the other element by bone was also studied.

—R.M.

Davies, J., Brown, E. B., Stewart, D., Terry, C. W. & Sisson, J. (1959). **Transfer of radio-**

active iron via the placenta and accessory fetal membranes in the rabbit. — Amer. J. Physiol. **197,** 87-92. **879**

Iron sulphate labelled with Fe^{59} was injected i/v or into the uterus. Early in pregnancy iron was stored in the yolk sac and foetal placenta, but from the 18th day onwards iron entered the foetus in increasing amounts. By the 27th day iron was transferred from placenta to foetus very rapidly and there was almost none in the yolk sac. [See also *V.B.* **28,** 3322.]—R.M.

Luick, J. R., Kleiber, M. & Lucas, J. M. (1959). **Fructose metabolism in the udders of dairy cows.**—Amer. J. Physiol. **197,** 670-680. **880**

Fructose labelled with carbon-14 was infused into one quarter of a lactating udder. Unlike glucose, fructose was not converted into lactose in the udder; it was oxidized and labelled carbon appeared in milk protein, butter-fat, citrate and CO_2.—R.M.

I. McCance, I. & Alexander, G. (1959). **The onset of lactation in the Merino ewe and its modification by nutritional factors.**—Aust. J. agric. Res. **10,** 699-719. [Authors' summary modified.] **881**

II. Alexander, G. & Davies, H. L. (1959). **Relationship of milk production to number of lambs born or suckled.** — Ibid. 720-724. [Authors' summary.] **882**

I. The type of udder contents and rate of milk secretion in the Merino ewe at about the time of parturition were studied. In general there was a sequence of changes from a slowly secreted, viscous material to rapidly secreted "normal colostrum" and normal milk. In well fed ewes the viscous material had usually been replaced by later-appearing types at parturition and copious lactation commenced at or some hours before lambing. In ewes poorly fed during the last 2–6 weeks of pregnancy, the changes were delayed; the viscous material, or no secretion at all, was often present at parturition, and copious lactation was often not apparent until up to 12 hours after parturition. After the onset of copious lactation, the rate of secretion by poorly fed ewes was about half that of ewes well fed during pregnancy. The Merino is a relatively poor producer of milk even when well fed and the delayed onset of lactation and reduced production of milk by poorly fed ewes would substantially reduce the chance of survival of lambs in early life.

II. Two independent sets of data, obtained by two different methods of measuring milk production, show that milk yield is greatly influenced by the number of lambs suckled but not by the number of lambs born.

Hart, D. S. & Laffey, N. (1959). **The effect of thyroxine on lactation in ewes.**—N.Z. J. agric. Res. **2,** 666-676. [Authors' summary modified.] **883**

Measurements of growth rates obtained over three years from some 289 lambs, about half of which had been suckled by ewes implanted with l-thyroxine, were used to indicate the lactation level of the treated and control ewes. Evidence of lactation response from the treated ewes was obtained from (1) mature ewes implanted with thyroxine (a) six weeks before lambing, (b) 2–3 days after lambing, and (2) two-tooth ewes implanted about the time of mating.

Meites, J. & Nicoll, C. S. (1959). **Hormonal prolongation of lactation for 75 days after litter withdrawal in postpartum rats.**—Endocrinology **65,** 572-579. [Authors' abst. modified.] **884**

Litters were removed from rats 4 days after parturition, and hormones were injected daily in an attempt to prolong milk secretion and retard mammary involution. S/c inj. of 1 mg. prolactin, 1 i.u. oxytocin (twice daily) or 0·5 mg. hydrocortisone acetate maintained secretory activity and partly inhibited involution for 10–20 days. Daily injections of prolactin with oxytocin or hydrocortisone acetate were more effective than prolactin alone, while in rats receiving all 3 hormones in combination milk could be expressed manually from the nipples for 75 days.

Barnes, A. E. & Jensen, W. N. (1959). **Blood volume, and red cell concentration in the normal chick embryo.** — Amer. J. Physiol. **197,** 403-405. **885**

Total blood volume increased from an average of 0·6 ml. at the 9th day of incubation to 3·3 ml. at 18 days. the proportion of blood volume to embryo weight decreased from 315 to 154 ml./kg. during this period. The total volume of erythrocytes decreased only slightly during the same period, from 60 to 52 ml./kg. embryo weight.—R.M.

Morrissette, M. C., McDonald, L. E. & Thayer, R. H. (1959). **Hematology of growing chickens.**—Poult. Sci. **38,** 249-254. **886**

The effect of mild stressors (mould, dietary sulphaquinoxaline, avian encephalo-

myelitis) on blood values, capillary strength and histology of battery-reared fowls was studied. The effect of liver extract on resulting symptoms was investigated. Capillary strength (measured by negative pressure) did not vary among the groups but it increased with age. Frequent application of negative pressure to the same area increased capillary resistance to breakdown. A plateau in the increasing capillary strength coincided with the lowest r.b.c. and Hb values at the 7th week of age. Avian encephalomyelitis and/or sulphaquinoxaline caused a decrease in r.b.c. and an increase in clotting time; these effects were reversed by liver extract. Continued feeding of sulphaquinoxaline caused a drop in r.b.c. counts at 20 and 34 days with a return to normal at 48 days. There were no histological changes in liver, skeletal muscle and bone marrow, nor were there lesions suggestive of the haemorrhagic syndrome. Results indicate that blood values in normal chickens are subject to great fluctuations which may be increased by disease and drugs.—T.E.G.R.

Ackerman, G. A. & Knouff, R. A. (1959). **Lymphocytopoiesis in the bursa of Fabricius.** —Amer. J. Anat. **104,** 163-205. **887**

The bursa was examined by morphological and histochemical methods in 160 embryos and chicks between the 11th day of incubation and 16 days after hatching. Lymphocytes appeared to originate from undifferentiated endodermal, epithelial cells. [13 plates of photomicrographs.]—R.M.

Sheppard, A. J., Forbes, R. M. & Johnson, B. C. (1959). **Rate of acetic acid production in the rumen determined by isotope dilution.** —Proc. Soc. exp. Biol., N.Y. **101,** 715-717. [Authors' summary modified.] **888**

The method of isotope dilution using acetate-1-C^{14} revealed that normal sheep fed hay produced acetic acid in the rumen by bacterial synthesis at the rate of 0·126 millimole per ml. of rumen liquor for 7 hours after feeding. Radioactivity was also found in propionic, butyric and higher acids, demonstrating their formation from acetic acid in the rumen.

Andersson, B., Kitchell, R. & Persson, N. (1959). **On central regulation of rumination and reticulo-ruminal motility.** — J. Physiol. **147,** No. 1. p. 11P of Proceedings. **889**

In conscious goats (with closed fistulae of the rumen, reticulum and abomasum) the areas controlling vomition, rumination and motility of the rumen and reticulum were determined by electrical stimulation of the medulla oblongata at different sites. These centres were described and discussed.—T.E.G.R.

Lindenmaier, P. R. (1959). **The taste end-organs of the chicken.**—Thesis, Cornell pp. 28. **890**

In view of the limited knowledge of the taste mechanism in the domestic fowl, L. studied the anatomical and histochemical nature of the taste receptor mechanism. Taste buds were few and their distribution was limited to the base of the tongue and floor of the pharynx caudal to the row of large horny papillae. They differed from mammalian taste buds.

In day-old chicks there were on an average 8 buds, in the 10-week-old bird 31, and in the 12-week-old 24. This leaves some doubt as to whether they are the sole receptors of the sense of taste; possibly the enlarged fasciculus solitarius may amplify taste impulses.

The enzymes and/or special cell types in the deep layers of the mucosa might function as chemoreceptors but it is doubtful if sapid substances could diffuse through the overlying tissue in sufficient amounts to stimulate effectively such deep-lying receptors.

—H. L. Gilman.

Kessler, R. H., Hierholzer, K. & Gurd, R. S. (1959). **Localization of urate transport in the nephron of mongrel and Dalmatian dog kidney.**—Amer. J. Physiol. **197,** 601-603. **891**

In mongrel dogs the renal clearance of urate is considerably less than the rate of glomerular fitration because of re-absorption by tubule cells. Dalmatian dogs not only failed to reabsorb urate but exhibited modest secretion of urate in the proximal segment of the nephron. This secretion was abolished by the action of probenecid (Benemid) which in ordinary dogs increases urate excretion by diminishing re-absorption.—R.M.

Horváth, I. & Kiszely, G. (1959). Histochemische Untersuchung des Rinderendometriums. I. Histochemische Veränderungen des intakten Endometriums in den verschiedenen Phasen des Geschlechtszyklus. **[Histochemistry of the bovine endometrium. I. Changes during oestrous cycle.]**—Acta vet. Acad. Sci. hung. **9,** 27-37. [In German.] **892**

Endometrium from slaughtered or from living heifers and cows was stained to show alkaline phosphatase, glycogen and mucopolysaccharides. As in human endometrium,

greatest glycogen formation did not parallel highest phosphatase activity. Maximum content of mucopolysaccharides in epithelium and glands occurred firstly at ovulation and secondly at the regression stage: the peak at ovulation may be important in providing optimum conditions for spermatozoa.—R.M.

Dellmann, H. D. (1959). Beitrag zur Kenntnis des Hypothalamus - Hypophysen - Systems beim Rind. I. [**The hypothalamus-pituitary system in cattle. I.**]—Anat. Anz. **106,** 202-253. **893**

A detailed histological study of the structure of the ox hypothalamus. Five groups of nerve cells were distinguished.—M.G.G.

Lascelles, A. K. & Manusu, P. (1959). **The healing of surgical wounds in the skin of the sheep.**—Aust. J. exp. Biol. med. Sci. **37,** 11-15. **894**

The rate of healing of surgical skin wounds in sheep was assessed on the basis of the strength of the wounds: the strength increased with the time after operation. Wounds closed with Michelle clips healed more quickly than those closed with transverse mattress sutures.—N. WICKHAM.

Vitums, A. (1959). **Portal vein in the dog.**—Zbl. VetMed. **6,** 723-741. [In English. Summaries in French, German and Spanish. Author's summary modified.] **895**

The extrahepatic part of the portal system was composed of the trunk of the portal vein and its tributaries. Four tributaries (common mesenteric, gastro-splenic, gastro-duodenal, and right gastric veins) joined the trunk of the portal vein. A special study was made of the venous drainage of the greater omentum. Communications between the portal vein and the systemic veins will be the subject of another report.

See also abst. **928** (report, National Institute for Research in Dairying).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Van der Mijll Dekker, L. P., Mossel, D. A. A., De Bruin, A. S. & Manten, A. (1959). **The presumptive detection of some antibiotics in foods, using a simple microbiological test.**—J. Sci. Fd Agric. **10,** 475-478. [Authors' summary modified.] **896**

A simple and sufficiently sensitive test for antibiotics in meat, egg and milk was based on the principle that the food under investigation is mixed with double-strength agar containing triphenyltetrazolium chloride as an indicator of bacterial growth. The agar dispersion so obtained is streak-inoculated with suitable test strains and incubated, using as a blank a mixture of agar and an identical food sample known to be free from added antibiotics.

Pugsley, L. I. (1959). **Food additive control in Canada.** pp. 37. Rome: Food and Agriculture Organization of the United Nations. FAO Food Additive Control Series No. 1. **897**

This is the first number in a series entitled Food Additive Control, describing the national systems for regulating manufacture and use of food additives. Each number will cover one country.

It should be regarded as complementary to the periodical Current Food Additives Legislation (CFAL), issued since June 1956, which provides regular abstracts of new food-additive legislation.—R.M.

Schuman, L. M. (1959). **The first National Institute on Veterinary Public Health Practice.**—Amer. J. publ. Hlth **49,** 213-224. **898**

The objectives and the formation of the institute are outlined and some of its main activities are presented. The institute will cover such fields as: food hygiene, medicine and surgery, care of laboratory animals, occupational disease, professional education, military veterinary medicine, biological and pharmaceutical products, and control of dental diseases.—T.E.G.R.

See also absts. **636** (salmonella in animal products and feeds); **646** (brucella in mutton); **659** (tubercle bacilli and brucella in fresh cheese); **660** (R. burneti, brucella and pasteurella in wild animals); **839** (Sr-90 in human diet in the U.K.); **935** (lectures on the scientific basis of medicine); **936** (list of veterinary films).

LIVESTOCK HYGIENE

Hill, A. G. G. (1959). **Grazing control: laws and regulations in various countries for the control of grazing to prevent injury to grasslands.** pp. 27. Farnham Royal: Commonwealth Agricultural Bureaux. Mimeographed Publication No. 2/1959 of the Commonwealth Bureau of Pastures and Field Crops. 7s. 6d. **899**

34 countries have legislation to control grazing in one way or another, and 29 have not. —R.M.

See also abst. **636** (salmonella in poultry feeds).

REPRODUCTION AND REPRODUCTIVE DISORDERS

Cooper, D. M. & Rowell, J. G. (1959). **A comparison of two techniques for inseminating chickens.**—Vet. Rec. **71**, 715-717. [Authors' summary modified.] **900**

A technique is described which resulted in an improvement in fertility of 15·6% compared with the technique previously used. There was a suggestion in the results that fertility decreases with decreasing volumes of semen injected over the range 0·05 to 0·01 ml.

Norman, C. & Goldberg, E. (1959). **Effect of light on motility, life-span, and respiration of bovine spermatozoa.** — Science **130**, 624-625. **901**

Exposure to light of bovine spermatozoa suspended in various media results in a progressive decline in metabolic activity followed by the premature death of the cells. The inhibitory and spermicidal effects of visible light resemble a photodynamic action; the photosensitizer is an intrinsic component of the cell.

Wilson, R. L., Godley, W. C. & Hurst, V. (1959). **The effect of temperature on ram spermatozoa.** — Vet. Med. **54**, 481-483 & 486. **902**

In an experiment carried out in two phases (July–August and August–September) six rams were divided into 3 groups of 2. Group 1 was kept under controlled temp. (58–72°F.) throughout; group 2 was kept outside (average temp. 91°F.) during phase 1 and with group 1 during phase 2; group 3 was kept outside throughout. During phase 1 semen quality (motility and progressive movement of spermatozoa) in groups 1 and 2 did not show significant differences but was significantly higher than in group 3; semen concentration was significantly higher in group 3 than in 1 or 2. During phase 2 there was no significant difference in semen quality between the 3 groups but semen conc. was significantly higher in groups 1 and 3 than in 2. In both phases there were small but insignificant differences in semen volume between the groups. Within groups there was considerable variation in semen characteristics. There was little or no evidence that low temperatures affected semen quality.—T.E.G.R.

Edgar, D. G. (1959). **Examination of rams for fertility.**—N.Z. vet. J. **7**, 61-63. [Author's summary modified.] **903**

Semen samples were collected by rectal stimulation on three occasions from 296 stud rams, and the semen quality compared with the breeding performance of the rams. The minimal requirements of a satisfactory sample appeared to be milky appearance, 50% motile spermatozoa, moderate motility, and less than 20% abnormal spermatozoa. Highly fertile rams sometimes gave unsatisfactory semen samples, but rams of low fertility gave no satisfactory sample.

De Gracia Pinto, A., Ferri, A. G. & Tabarelli Neto, J. F. (1959). Modificações morfológicas do ovário de "Bos indicus" durante o ciclo estral. **[Morphological changes in the ovary of zebu cattle during the oestrous cycle.]**—Rev. Fac. Med. vet., S. Paulo **6**, (1957). 53-70. [Summary in English.] **904**

The authors examined 5 calves, 6 virgin heifers and 7 cows killed at known stages of the oestrous cycle. In general the ovaries in zebu cattle closely resembled those of European breeds of cattle.—R.M.

Hancock, J. L. (1959). **Polyspermy of pig ova.** —Anim. Prod. **1**, 103-106. [Author's summary modified.] **905**

Of 168 pronucleate ova from sows killed at intervals after mating (0, 24, 30 and 48 hours), 20 showed more than 2 pronuclei; 19 of these were from sows in which mating was delayed until 30 to 48 hours after the onset of heat. Evidence is presented that polyspermic fertilization is responsible for the ova with more than 2 pronuclei. It is concluded that delayed mating increases the frequency of polyspermic fertilization and might be a source of embryonic mortality in pigs inseminated artificially.

Santamarina, E. & Joven, L. L. (1959). **Evaluation of reliability of a diagnosis test for pregnancy in mares based on the presence of gonadotrophic hormones.**—J. Amer vet. med. Ass. **135**, 383-387. **906**

The test based on inoculation of immature female mice was applied to sera from 215 mares. With one exception it gave accurate results for 211 mares served 39–152 days previously. The exception was a false positive result given by a mare believed to have a neoplasm in the genital tract. 4 mares tested 30–32 days after service gave false negative results.—R.M.

Lindner, H. R. (1959). **Androgens in the bovine testis and spermatic vein blood.**—

Nature, Lond. **183,** 1605-1606. **907**

Excretion of androgens by bull testicle into the blood began at an early age. In calves 3 months old androstenedione predominated while in adult bulls testosterone predominated. In adult rams the proportion of these two steroids was the same as that in adult bulls.

—R.M.

Lamond, D. R., Radford, H. M. & Wallace, A. L. (1959). **Bioassay of sheep anterior pituitary glands.**—Nature, Lond. **183,** 1597-1598. **908**

There were no appreciable seasonal differences in gonadotrophin content of anterior pituitary glands from Merino ewes, although there was seasonal variation in frequency of twin ovulation. The authors discussed the technique of assay by the action of gland extracts on the weight of the uterus in immature mice.—R.M.

Shulov, V. V. (1959). [**Application of pregnant mares' serum in sheep breeding.**]—Veterinariya, Moscow **36,** No. 11 pp. 12-15. [In Russian.] **909**

The Chimkent combine of Karakul breeding farms in Kazakhstan issued 3,820 litres of pregnant mares' serum during the 1959 breeding season, enough for 350,000 sheep, about a third of all sheep on the farms. The sheep were inseminated artificially within 6 days of injection. The number of lambs born to every 100 treated ewes ranged from 132 to 176 in different flocks.—R.M.

Edgar, D. G., Flux, D. S. & Ronaldson, J. W. (1959). **Comparison of chemical and biological estimations of plasma progestin.**—J. Endocrin. **19,** 44-51. [Authors' summary modified.] **910**

The progesterone content of plasma from the vein draining the ovary containing a corpus luteum and of jugular venous plasma from each of two pregnant ewes, as estimated by the chemical method of Edgar & Ronaldson [1958], was compared with the 'progestin' content estimated by the biological method of Hooker & Forbes [1947].

It appeared that all, or almost all, the progestational activity of the ovarian venous plasma could be accounted for in terms of progesterone, but that the jugular venous plasma, in which no progesterone was detected chemically, may have contained progestins other than progesterone.

Halliday, R. (1959). **The occurrence of corpora lutea atretica in the ovaries of pregnant domestic rabbits.** — J. Endocrin. **19,** 10-15. [Author's abst. modified.] **911**

Corpora lutea atretica were present in 40% of pregnant domestic rabbits and accounted for 7·6% of all corpora lutea. They were commoner during that part of the year when the rabbit breeds most freely, and were probably all formed at the beginning of pregnancy from unruptured follicles. Their formation may be associated with endocrinological imbalance since their distribution is not uniform throughout the population and is significantly related to increased loss of ova before implantation.

Groulade, P. & Groulade, J. (1959). La microélectrophorèse sur papier dans les affections utérines chez la chienne. (Métrites—métrorragies—pyomètres). [**Paper electrophoresis of serum from bitches with disorders of the uterus.**] — Bull. Acad. vét. Fr. **32,** 397-405. **912**

An increase in total proteins was observed in all bitches with metritis, metrorrhagia or pyometra. This was believed to be associated with vomiting, diarrhoea and anorexia over a number of days, resulting in haemoconcentration. The therapeutic value of rehydration was demonstrated. Albumin fractions decreased in all three conditions; the lowest values were observed in fatal cases. Changes in globulin fractions were also described.—T.E.G.R.

Bell, D. J., Siller, W. G. & Campbell, J. G. (1959). **Observations on 'cage layer fatigue' (CLF) in hens.** — Biochem. J. **72,** No. 3. p. 32P of Proceedings. **913**

The condition occurred in a severe form (shortly after onset of lay) among caged hens laying normal shelled eggs, but not in full sisters housed in pens and fed on the same diet. Two types were observed: (a) extreme leg weakness sometimes followed by recovery on hand feeding: (b) sudden death shortly after laying. In both types there was extensive decalcification of bone. In type (b) there were no obvious visceral abnormalities beyond generalized venous congestion and systolic heart failure. The bone changes differed from those of osteomalacia, osteoporosis and rickets and showed marked osteoclastic activity and thinning of both the compact and the spongy components. The plasma Ca, inorganic P and Mg were unaffected but alkaline phosphatase activity was very high in cases of type (a) and in one or two of (b) when it was possible to sample blood before death. Bromosulphthalein liver-clearance tests indicated hyperoestrogeni-

zation in several (a) cases as long as 1 month after the first collapse. A study of the alkaline phosphatase activity of 6 caged hens revealed initially a marked increase during a period of intensive laying and progressively smaller increases in subsequent bursts of heavy production; this suggested the establishment of homeostasis. The lesions and causation of the condition are discussed.—T.E.G.R.

Barraclough, C. A. & Sawyer, C. H. (1959). **Induction of pseudopregnancy in the rat by reserpine and chlorpromazine.** — Endocrinology **65**, 563-571. **914**

Prolonged interruption of normal oestrous cycles in rats treated with reserpine or chlorpromazine is due to the release of luteotrophin from the adenohypophysis.—R.M.

Ludwig, E. (1959). Ureteranomalien bei Embryonen des Rindes. **[Ureter anomalies in bovine embryos.]**—Acta anat. **38**, 79-95. **915**

While studying kidney development in embryos obtained from slaughtered cows, split or duplicated ureters were found in five embryos.—R.M.

van't Hooft, A. J. G. (1959). Keratogenesis imperfecta hereditaria bovina. Een erfelijk mond- en klauwgebrek bij het rund. **[Hereditary defective keratogenesis of hooves and mouth in cattle.]** pp. 112. Wageningen: Centrum voor Landbouwpublikaties. [Versl. Landbouwk. Onderz. No. 65.6] Fl. 7.75. [Summaries in English, French and German.] **916**

A full account of a fatal condition observed in calves of the Meuse-Rhine-Yssel breed, with 23 illustrations (6 in colour) of lesions. Although initial lesions resembled those of foot and mouth disease, eventually the horn of all four hooves and dew claws was shed and epithelial defects of tongue, dental pad and hard palate increased in size. Affected calves died 1–7 months after the first signs were noticed. Their sires and dams appeared to originate from certain bulls which, in the fifth generation, had a common ancestor, and there was evidence of simple recessive transmission. 35 of 42 cases were female. Histological examination showed that disintegration of oral epithelium and hoof keratin was preceded by degeneration and disintegration of cylindrical cells of the Malpighian layer of the epidermis. The cylindrical cells did not regenerate. Although heterozygous bulls all belonged to the same blood group, this group was not inherited by their calves. Further investigations are being made into blood groups.—R.M.

See also absts. **623** (genital infection in cattle with Corynebact. pyogenes); **629** (bovine abortion by haemophilus); **643** (brucella orchitis in a sheep dog); **675** (toxoplasma abortion in sheep); **798** (disease of pregnant and lactating sows); **822** (" straight hocks " in Dutch cattle); **823** (neonatal mortality in lambs); **824** (convulsive syndrome in sheep); **882** (relationship between milk production in ewes and number of lambs).

ZOOTECHNY

Zaoralek, P. E. (1959). Die Geschlechtsdiagnose an den neutrophilen Leukozyten des Pferdes. **[Sex determination in horses based on neutrophile leucocytes.]**—Schweiz. Arch. Tierheilk. **101**, 502-508. [In German. Summaries in English, French and Italian.] **917**

Examination of 80 blood smears from 30 adult horses revealed the presence of "drumstick" protuberances from the nucleus in 1·4% of segmented neutrophiles and 1·2% of unsegmented neutrophiles in blood from mares. In stallions only 0·64% of neutrophiles contained nuclear protuberances and these lacked the long thin neck that gives rise to the description "drumstick" in mares.—R.M.

Preston, T. R., Greenhalgh, I. & MacLeod, N. A. (1959). **The effect of hexoestrol implants on suckling and weaned lambs fattened on farms in the north-east of Scotland.** — Anim. Prod. **1**, 135-138. [Authors' summary modified.] **918**

768 lambs on 14 farms were divided into a control group and groups receiving two 5 mg., three 5 mg., two 7·5 mg., and one 15 mg. pellet of hexoestrol.

On every farm the mean rate of liveweight gain of the treated lambs was greater than that of the controls. There appeared to be very little difference between implantations of two 5 mg., three 5 mg. and two 7·5 mg. pellets of hexoestrol but on four farms where a direct comparison was made one 15 mg. pellet was slightly inferior to three 5 mg. pellets.

See also abst. **932** (book, sheep management and diseases).

TECHNIQUE AND APPARATUS

Brook, P. J. (1959). **A volumetric spore trap for sampling pastures.**—N.Z. J. agric. Res. 2, 690-693. **919**

A machine has been designed to collect spores, in particular those of *Sporidesmium bakeri*, from pasture. As it is pushed across the pasture, rotating blades between the wheels throw up spores which are sucked into an impactor.—M.G.G.

Wright, S. T. C. (1959). **A quantitative serum-agar technique.** — Nature, Lond. **183**, 1282-1283. **920**

A method is described for the quantitative estimation of protein constituents in a multiple protein system. This consists in titrating antigen on to antibody and following the titration on a modified Ouchterlony plate. Two end-points are obtained: (a) where free antibody is just detectable; (b) where free antigen is just detectable. Relative protein concentration within ±4% was obtained with this method, and it is considered that the technique (which is described and illustrated) could probably be developed to limits of ±2%.—T.E.G.R.

Bowen, W. J. & Martin, H. L. (1959). **Analysis of serum magnesium in presence of calcium with chrome fast blue BG.**—Proc. Soc. exp. Biol., N.Y. **101**, 734-736. [Authors' summary modified.] **921**

Use of this dye affords immediate determination of serum Mg without removal of calcium and with no addition of stabilizers. The dye as used here is sensitive to as little as 0·01 microequivalent of magnesium.

Hodgetts, V. E. (1959). **The influence of centrifugational treatment upon haematocrit values and the trapped plasma correction factor of sheep blood.**—Aust. J. exp. Biol. med. Sci. **37**, 97-106. **922**

In the determination of haematocrit values for sheep blood more intense centrifugation is desirable than that adequate for human blood. Recommended centrifugational treatment of sheep blood at 5,000 r.p.m. for 60 min. (radius of gyration 17 cm.) gives approx. the same degree of packing of red cells as occurs with human blood at 3,000 r.p.m. for 30 min. Under these conditions the trapped plasma correction factor is approx. 0·97 and haematocrit values are more precise than under less intense centrifugation.—N. Wickham.

Ferri, A. G. & Mota, I. (1959). **The fixation of mast cells.**—Rev. Fac. Med. vet., S. Paulo **6**, (1957) 27-36. [In English.] **923**

Suitable fixative was composed of 100 ml. 50% alcohol, 1 g. lead acetate and 0·5 ml. acetic acid. This gave the best results with tissues from domestic animals.—R.M.

Pert, J. H., Engle, R. E., Jr., Woods, K. R. & Sleisenger, M. H. (1959). **Preliminary studies on quantitative zone electrophoresis in starch gel.** — J. Lab. clin. Med. **54**, 572-584. [Authors' summary modified.] **924**

Electrophoretic separation of proteins in starch gel has shown that there are critical limits for the preparation of soluble starch, buffer, and proportions of these used in making the gels, but these limits are easily obtained with ordinary laboratory equipment.

A survey of 100 normal and 400 abnormal sera indicated that while there are many normal serum types, each with complex patterns, changes in disease can be recognized. Because of variation in normal serum protein patterns, recognition of change specific to a given disease requires quantitative gel strip analysis and adequate treatment of data. For testing the homegeneity of several purified proteins, zone electrophoresis in starch gel gave rapid and sensitive results comparable with or better than those obtained by other methods.

Larin, N. M., Barr, Y. M. & Orbell, W. G. (1959). **Nuclear aberrations in cultures of "normal" cells from four animal species.**—J. comp. Path. **69**, 377-384. [Authors' conclusions.] **925**

A high incidence and great variety of cytological aberrations were observed in short term cultures of normal cells from healthy dogs, pigs, ferrets and chick embryos. They bore no apparent relation to either the technique or culture medium. The most striking phenomenon was amoeboid activity of cell nuclei, the incidence of which was high in all the cultures studied. It is suggested that amoeboid nuclei may be responsible for the phenomenon of "nuclear phagocytosis" and also for the spontaneous occurrence of intranuclear inclusion bodies.

Aycardi, J. (1959). Utilisation du hamster doré dans les laboratoires. **[Utilization of the golden hamster in laboratories.]** — Thesis, Paris (Alfort) pp. 820. **926**

A review of literature on the use of hamsters for biological, medical and veterinary research.—R.M.

See also absts. **637** (diagnosis of brucellosis); **657** (anaerobic culture); **723** (tissue culture of fowl plague virus); **724-725** (tissue culture of Newcastle disease virus).

MISCELLANEOUS

Gourlay, R. N., Nunn, W. R. & Coyle, T. J. (1959). **Deliberate asphyxiation of cattle in a primitive area of Uganda.**—Vet. Rec. **71**, 743-745. [Authors' summary modified.] **927**

Investigation of the cause of deaths of cattle at a quarantine camp in north-eastern Uganda revealed that deliberate asphyxiation had caused a significant portion of the deaths. The lesions are described and the methods employed and motives for the killings discussed.

REPORTS

Great Britain. (1959). **National Institute for Research in Dairying, University of Reading, report 1958.** pp. 149. Shinfield: The Institute. 4s. **928**

This report describes the very wide range of activities of the Institute. Topics of veterinary interest included experimental copper poisoning of pigs (p. 29); effect of different pasture plants and fertilizers on grass tetany in cows (pp 34 and 40); magnesium metabolism in cattle (p. 77) influence of diet on secretion and composition of saliva in cows (p. 41); physiology of lactation (p. 48); studies with tritium-labelled hexoestrol (p. 56); bovine mastitis (p. 65); microflora of the alimentary tract of cattle, pigs and chicks (p. 67): rheology of cows' blood (p. 86). There is a list of 182 papers published during the year.—R.M.

Australia. (1958). **Northern Territory Administration. Animal industry branch. Twelfth annual report 1957-1958. (Covering activities for the year ending 30/6/58.)** [Rose, A. L.] pp. 49. Alice Springs: Animal Industry Branch. **929**

TUBERCULOSIS was found in 2% of 655 cattle and 4·8% of 1,081 pigs slaughtered at Darwin; it was not found in cattle slaughtered at Alice Springs. A survey of the incidence in buffaloes has begun. A few cases of PASTEURELLOSIS were seen in cattle shipped to the Philippine Islands. BOVINE CONTAGIOUS PLEUROPNEUMONIA was detected in nine mobs of travelling cattle, but is rarely seen on cattle ranches. Only two cases were seen in 6,505 cattle slaughtered at Darwin. The seton method of inoculation had been continued to provide information on the persistence of the seton as evidence of vaccination, but has now been replaced by syringe inoculation. The Central Australia Protected Area remained free from the disease and it is probable that soon cattle from the area will be accepted by all other States. The micro complement-fixation test is satisfactory and may replace the original c.f. test. There appear to be variant strains of the organism in endemic areas.

Tick Fevers were reported in marginal areas and in some travelling herds and there was an outbreak in cattle on board ship en route to the Philippine Islands. Studies continued on the species of *Theileria* isolated from cattle. When first isolated it was highly pathogenic and clinical symptoms and P.M. findings were not typical of other tick fevers. The severity of symptoms was modified by treatment with "Acaprin" (quinuronium sulphate) but the course of the disease was not affected by immunization against *Babesia bigemina, B. argentina* or *Anaplasma centrale.*

Boophilus microplus commonly occurred in the Darwin Gulf and Victoria River districts. Studies began on the survival of larvae in the Barclay Tableland region. BUFFALO FLY *(Siphona exigua),* prevalent in the far north, can be controlled by spraying at three-weekly intervals with toxaphene.

OSTEOMALACIA was prevalent in cattle in the Barclay Tableland region during a very dry season. It is thought that there may be considerable losses from BOTULISM under such conditions when bone-chewing is prevalent.

In the Alice Springs district 40 properties were affected with BIRDSVILLE DISEASE of horses; the causal plant, *Indigofera enneaphylla* may be spreading. Research into the toxic principle has continued and "spectacular findings are expected to lead to simple control measures". Research has "led to simple control measures" for KIMBERLEY HORSE DISEASE (poisoning by *Crotalaria retusa*); no cases were seen. The Gidyea tree has been shown to cause GEORGINA RIVER DISEASE but it has not yet been practicable to control losses. A quick chemical test for the toxicity of the leaves and pods has been devised. Among other instances of plant poisoning were: immature *Salsola kali* (oxalic acid, cattle), *Swainsona campylatha* (horses), *Trianthema australis* (suspected, cattle).

MUCOSAL DISEASE was seen in bulls brought to Alice Springs from eastern States.

Buffaloes increased greatly in the far north but mortality, probably from malnutri-

tion, has reduced the herds. The possibilities of capturing and taming buffaloes for export and the ecology of this animal are being studied. Noxious animals include kangaroos, wild horses, donkeys, and camels.

An appendix gives an historical account of the development of the Animal Industry Branch from 1911.—H. McL. Gordon.

Australia. (1958). **Queensland. Annual report of the Department of Agriculture and Stock for the year 1957-58.** pp. 122. Brisbane: S. G. Reid, Govt. printer. [Items of veterinary interest pp. 64-111.] 930

Several cases of bovine Mastitis yielded cultures of *Klebsiella* type organisms. Testing for bovine Tuberculosis was reduced, partly by the institution of biennial tests in areas where eradication is proceeding satisfactorily, and also because the dry season precluded handling cattle in poor condition. Of 296,014 cattle tested 351 reacted. Pasteurellosis was seen in two lots of cattle which showed swellings suggestive of blackleg. *Pasteurella septica* was a common cause of abscesses in pigs. There was a slight decline in the use of *Brucella abortus* Strain 19 vaccine. Vaccination of adult cattle is now permitted but only in herds threatened with an abortion storm. A Brucellosis testing scheme for pigs has been developed. Enterotoxaemia is not common in sheep, but an outbreak occurred in goats. Botulism (Type C) occurred in ducks and magpies frequenting drying lagoons. Type D toxin was found in a bovine. The mucus agglutination test confirmed Vibriosis in all dairy districts, and in several beef herds with an infertility problem. Treatment with combinations of penicillin, streptomycin and sulphadimidine, with bull management where possible, has given reasonable control. Leptospirosis in cows and calves had a lower incidence in the dry season of 1957–58. *L. hyos* as a cause of abortion is being studied. A complement-fixation test was devised for diagnosis of Melioidosis, which was reported in pigs. Outbreaks of Bovine Contagious Pleuropneumonia were few and at the end of the year no properties were under quarantine.

There were 59 outbreaks of Tick Fever due to *Babesia argentina* and 5 due to *B. bigemina*: incidence was unusually high in the winter. Anaplasmosis was diagnosed twice. Blood from a steer infected with *B. argentina* was infective for about 5 months but small doses of blood (5 ml.) may not transmit the infection. When the carrier steer was given monthly booster doses of blood carrying *B. argentina*, it continued to transmit the parasite for 14 months. Compound 10,073 (a phenyl derivative of antrycide) given s/c was promising against both species of *Babesia*. Responses to "Ganaseg" (Berenil) were slow and relapses occurred.

Ephemeral (three-day) Fever occurs in north Queensland in the late summer months. The incidence of Fowl Pox was the highest for some years; mosquitoes were present in plague proportions.

Boophilus microplus infestations were not heavy, thanks to adverse seasonal conditions and vigorous control. "Asuntol" (Bayer 21/199) proved effective, with some residual value in preventing re-infestation. A few engorging nymphs survived and later completed their life-cycle. The efficiency of two formulations of DDT is being studied. Buffalo Fly (*Siphona exigua*) was controlled by back-rubbers impregnated with 5% DDT in fuel oil. The Stickfast Flea (*Echidnophaga gallinacea*) on dogs, cats and poultry has extended its range as far north as Cairns. The Itch Mite (*Psorergates ovis*) was prevalent on sheep in the south-west area of the Darling Downs. Dipping with a dieldrin–lime sulphur mixture was effective. There was a seasonal fluctuation in the population of mites which were plentiful in spring and early summer, but scarce by the autumn. There was a rapid increase in winter and early spring. The severity of clinical symptoms was not always related to the mite population. Louse Infestations were heavy in cattle but control in sheep was greatly improved. Sheep Blowfly Strike was reduced by the dry season. "Asuntol" applied as a 0·75% spray persisted in the fleece of long wooled sheep for 16 weeks; in sheep treated with 0·05% two months after shearing it persisted only 4 weeks. Two other organic P compounds "Nexion 1384" and DDVP at 0·1% disappeared from the fleece in 4 weeks. The available means for control are discussed, with emphasis on the Mules operation. The Leg Itch Mite (*Trombicula sarcina*) has been found on sheep further south than before, but is still on the same type of soil where it was originally found.

Haemonchus placei caused outbreaks in cattle. Lungworms (*Dictyocaulus viviparus*) were found in slaughtered cattle from a wide area, but infestations were very slight. Hookworms (*Bunostomum phlebotomum*) caused severe losses. Little trouble was experienced in sheep owing to the dry season, except in

coastal areas where sheep rearing is increasing, and in the north. Many pig carcasses were condemned for SPARGANOSIS (plerocercoids of *Spirometra erinacei*). Most of the pigs were feral, or had been running on open range.

A disease characterized by anaemia and haemoglobinuria, and associated with extremely low blood phosphate levels, occurred in cattle in a circumscribed area. It was acute and mortality was high, but some cases responded to large doses of phosphate. Most cases occurred after calving, but some at all stages of pregnancy. P.M. findings included slight jaundice, khaki coloured areas in the lung, omentum and other organs, enlarged gall bladder, enlarged, very flabby heart with petechiae especially in the septa, slightly enlarged spleen and chocolate coloured blood.

Merino sheep maintained adequate copper reserves on pastures where cattle had very low reserves. Ingestion of *Paspalum dilatatum* appeared to interfere with copper metabolism in cattle; this was not due to molybdenum. Copper cerate injected s/c proved a satisfactory method of depot therapy in COPPER DEFICIENCY in cattle, but in sheep the injection caused exudation and sloughing in 30% of animals.

Regressions have been developed relating the phosphate, protein and calcium levels in faeces to their concentration in the diet selected by the grazing animal and offer an additional method for determining nutritional status. Nauru Rock phosphate contains excessive fluorine and is not a safe supplement for cattle. Maps show the occurrence of phosphate and copper deficient areas.

ARSENICAL POISONING killed many cattle; in one outbreak a mixture of arsenic and DDT was responsible. LEAD POISONING was recorded in foals, calves, dogs and adult cattle. Overdosing with phenothiazine killed many calves in one outbreak. Deaths occurred after dipping or spraying with BHC, dieldrin, organic phosphates, and DDT–BHC mixtures. Spraying with toxaphene occasionally caused malaise. SELENIUM POISONING occurred in horses near Richmond; the plant *Neptunia amplexicaulus* contained, on a dry-matter basis, 77 to 4, 334 p.p.m. of Se. In the Cape Yorke peninsula the selenium-accumulating plant was *Morinda reticulata*. PHALARIS STAGGERS (due to *P. tuberosa*) was reported for the first time in Queensland. *Emex australis* contains oxalic acid and killed pigs. Feeding linseed gradings caused heavy losses from HCN POISONING in sheep, cattle and horses. In one case where 11 of 13 cows died the gradings contained 454 mg. HCN/100 g.

In poultry an unidentified protozoan parasite occurred which appeared to respond to paludrine.—H. McL. GORDON.

United Nations. (1959). **Joint WHO/FAO expert committee on zoonoses. Second report.** —Tech. Rep. Wld Hlth Org. No. 169. pp. 83. 3s. 6d. [Also issued as F.A.O. Agric. Studies No. 47.] 931

The following are discussed: SALMONELLOSIS in man and animals, especially in poultry but also in cattle and pigs, its causation and control. LEPTOSPIROSIS occurs in animals and man in all parts of the world. The epidemiology follows a characteristic pattern similar to other zoonoses, animal to animal and animal to man. The chain of transmission with rare exceptions stops at human infection.

Under TUBERCULOSIS of animal origin the report deals with the eradication of bovine TB. chiefly by means of the tuberculin test. The continuing diminution of TB. in cattle is being accompanied by a great reduction and in some countries virtual elimination of bovine TB. in the human population. Though recorded cases of ANTHRAX both human and bovine are relatively few when compared with other zoonoses the data give a false impression of the importance of the disease. The estimated number of human cases is given as 9,000 a year but in reality it is thought to be between two and ten times that number. Amongst other zoonoses discussed are psittacosis, Q fever, arthropod-borne viral encephalitides, hydatidosis, animal influenza, toxoplasmosis, listeriosis, and dermatomycosis. There are 14 annexes.—D. S. RABAGLIATI.

BOOK REVIEWS

Belschner, H. G. (1959). **Sheep management and diseases.** pp. x+814. Sydney: Angus & Robertson Ltd. 6th Edit. 105s. 932

This book was first produced in 1950 and was sufficiently popular to make four new editions necessary before 1957. The sixth edition has been revised and enlarged so that recent advances in sheep husbandry may be included.

The scope of the book is wide and embraces breeding, husbandry and disease. As a work of reference, it will be very suitable for

Australian farmers and of great interest to British farmers, but it is not especially designed for veterinary surgeons. The original edition was 'planned as a guide and reference for all in the sheep industry' and it may be because of the wide aim that the author does not cater really efficiently for all classes. It has developed into a very well written guide for Australian sheep farmers.

Index and binding are good and references are adequate.—G. B. S. HEATH.

Voisin, A. (1959). **Soil, grass and cancer. Health of animals and men is linked to the mineral balance of the soil.** pp. xvii + 302. London: Crosby Lockwood & Son Ltd. 30s. **933**

This book will probably appeal to a wide public but the reader with scientific training may find it irritating. The main concept that 'the animal is a product of the soil' is stated on the first page. This fact has been realized for many years by biologists. Indeed, Albrecht, who is widely quoted by the author, says much the same thing. If the book were confined to enlarging on this fact, it would have been a pleasure to read, since the bibliography is extensive, and the opinions put forward are those of a deep thinker who understands grassland management. The description of how the amino-acid content of pasture may be increased by applying inorganic fertilizers is excellent. In this early section, the author says: 'in speaking of the little that we know, we should keep our eye fixed on the innumerable facts of which we have no knowledge whatever', and this seems to be the guiding principle during a considerable portion of the book.

In later chapters, the accepted facts are not so much in evidence and Voisin presents his theories. References are quoted in support of the theories, but they tend to be selected references and to ignore evidence which might discredit the theories. Also the conclusions drawn from available evidence are not always above criticism. For instance, because the diseased prostate contains less zinc than the normal prostate, it is suggested that lack of zinc in the diet causes the disease; from this, it is suggested that lack of zinc in the diet causes ageing of cells.

Veterinary surgeons who read the book may well quarrel with the evidence presented to show that manganese will prevent or cure brucellosis, or that spontaneous regeneration of tuberculosis of cattle always follows eradication by tuberculin testing unless the environment is changed.

In the reviewer's opinion, Voisin has not mastered the enormous difficulty of correlating two variables as unrelated as animal health and soil composition. On the other hand, he has written a book which is packed with information and contains so many theories that some of them may be correct. The present volume is to be followed by a more extensive work in which, it is to be hoped, more convincing evidence will be produced to support the theories.—G. B. S. HEATH.

Frank, E. R. (1959). **Veterinary surgery.** pp. ii + 338. Minneapolis: Burgess Publishing Co. 6th Edit. $6.50. **934**

The author of this book on large-animal surgery is Professor of Surgery at Kansas State University. It was formerly called "Veterinary surgery notes" and was first published in 1939. The sixth edition remains fundamentally the same but there has been much revision and addition. Quality of the paper and of the 343 illustrations has improved and is now very good.—R.M.

—. (1959). **British Postgraduate Medical Federation: Lectures on the scientific basis of medicine. Vol. VII 1957-58.** pp. xi + 496. University of London, Athlone Press. 45s. **935**

Most veterinary readers will find something of interest in this collection of 23 lectures. Items selected because of special interest are:— Experimental approach to the problems of resistance to tuberculosis, by R. J. W. Rees; Growth of viruses, by M. G. O. Stoker; Metabolism of gamma globulins, by J. H. Humphrey; Ageing processes in the female reproductive tract, by P. L. Krohn; Study of the circulation by dye dilution curves, by J. P. Shillingford.—R.M.

Anon. (1959). **List of veterinary films and films of veterinary interest.** pp. 227. Utrecht: International Veterinary Congress. Permanent Committee. Dutch guilders 5. **936**

At the 14th International Veterinary Congress held in London in 1949 it was resolved that the Permanent Committee of the International Congress should compile a world catalogue of veterinary films. A preliminary list was issued in 1956. This is the first full catalogue and it contains 735 titles classified under 30 subjects.—R.M.

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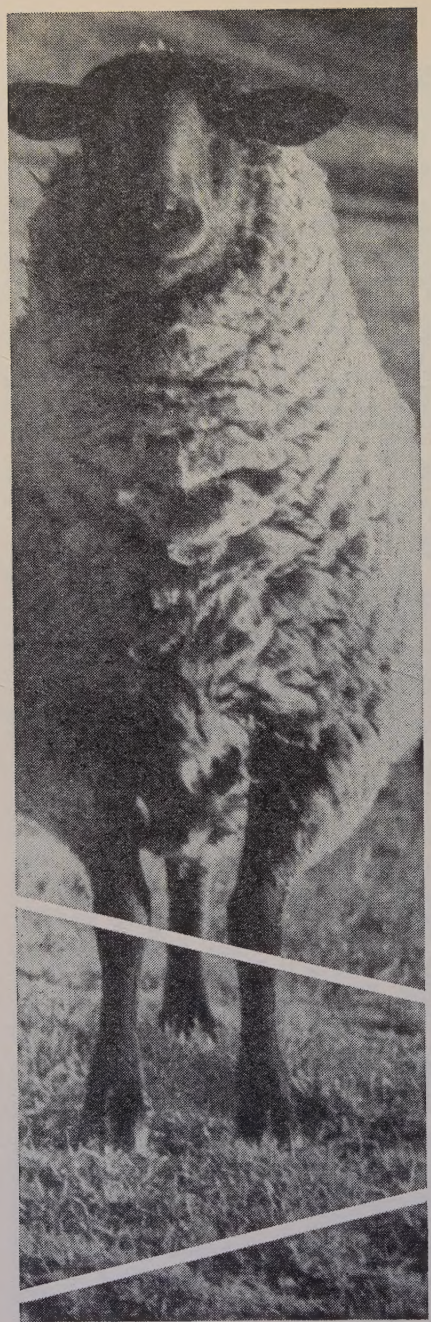

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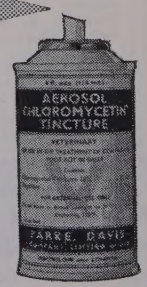

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